United States
Department of
Agriculture

Soil
Conservation
Service

In cooperation with the University of Florida, Institute of Food and Agricultural Sciences, Agricultural Experiment Stations, and Soil Science Department, and the Florida Department of Agriculture and Consumer Services

Soil Survey of Gilchrist County, Florida

How To Use This Soil Survey

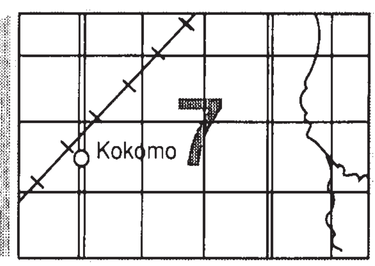
General Soil Map

The general soil map, which is the color map preceding the detailed soil maps, shows the survey area divided into groups of associated soils called general soil map units. This map is useful in planning the use and management of large areas.

To find information about your area of interest, locate that area on the map, identify the name of the map unit in the area on the color-coded map legend, then refer to the section **General Soil Map Units** for a general description of the soils in your area.

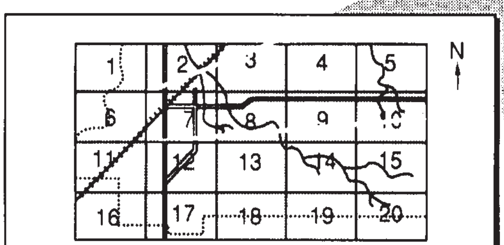
Detailed Soil Maps

The detailed soil maps follow the general soil map. These maps can be useful in planning the use and management of small areas.



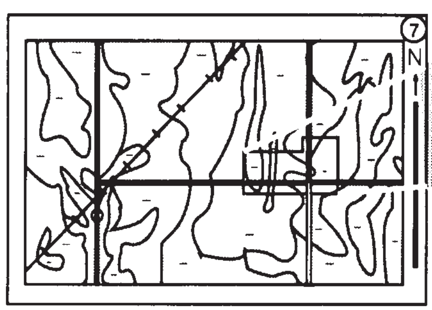
MAP SHEET

To find information about your area of interest, locate that area on the **Index to Map Sheets**, which precedes the soil maps. Note the number of the map sheet, and turn to that sheet.

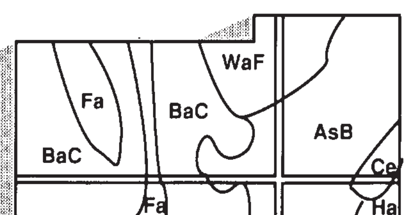


INDEX TO MAP SHEETS

Locate your area of interest on the map sheet. Note the map unit symbols that are in that area. Turn to the **Index to Map Units** (see Contents), which lists the map units by symbol and name and shows the page where each map unit is described.



MAP SHEET



AREA OF INTEREST

NOTE: Map unit symbols in a soil survey may consist only of numbers or letters, or they may be a combination of numbers and letters.

The **Summary of Tables** shows which table has data on a specific land use for each detailed soil map unit. See **Contents** for sections of this publication that may address your specific needs.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey.

Major fieldwork for this soil survey was completed in 1988. Soil names and descriptions were approved in 1988. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1988. This survey was made cooperatively by the Soil Conservation Service; the University of Florida, Institute of Food and Agricultural Sciences, Agricultural Experiment Stations, and Soil Science Department; and the Florida Department of Agriculture and Consumer Services. It is part of the technical assistance furnished by the Gilchrist County Soil and Water Conservation District. Additional assistance was provided by the Florida Department of Transportation. The Gilchrist County Board of County Commissioners contributed office space.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

All programs and services of the Soil Conservation Service are offered on a nondiscriminatory basis, without regard to race, color, national origin, religion, sex, age, marital status, or handicap.

Cover: Pasture and pecan trees in an area of Otela-Penney fine sands, 0 to 5 percent slopes.

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Issued September 1992

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Foreword

This soil survey contains information that can be used in land-planning programs in Gilchrist County, Florida. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Farmers, foresters, and agronomists can use it to evaluate the potential of the soil and the management needed for maximum food and fiber production. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are shallow to bedrock. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic tank absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

Niles Glasgow

T. Niles Glasgow
State Conservationist
Soil Conservation Service

Soil Survey of
Gilchrist County, Florida

By Robert L. Weatherspoon, Eddie Cummings, and William H. Wittstruck,
Soil Conservation Service

Fieldwork by Robert L. Weatherspoon, Eddie Cummings, William H. Wittstruck,
David J. Trochlell, and David A. Vyain, Soil Conservation Service

United States Department of Agriculture, Soil Conservation Service,
in cooperation with
the University of Florida, Institute of Food and Agricultural Sciences, Agricultural Experiment Stations, and Soil Science Department, and the Florida Department of Agriculture and Consumer Services

GILCHRIST COUNTY is in north-central Florida (fig. 1). It extends south more than 23 miles from the Santa Fe River to the Levy County line. Its maximum width, between the Suwannee River and Alachua County, is about 18 miles. Gilchrist County is bounded on the east by Alachua County and on the south by Levy County. The Santa Fe River separates it from Columbia County and Suwannee County to the north and Lafayette County to the northwest, and the Suwannee River separates it from Dixie County to the west.

The total area of Gilchrist County is 226,413 acres, or 340 square miles. Trenton, the county seat, is in the south-central part of the county.

In 1985, the county's population was about 7,008, an increase of 50 percent since 1970. The population of Trenton was about 1,401, an increase of 27 percent in 5 years. Newcomers are attracted to housing developments and apartments located within the city limits *(7)*.

Figure 1.—Location of Gilchrist County in Florida.

General Nature of the County

This section gives general information about the county. It describes history and development, climate, geomorphology, stratigraphy, ground water, mineral resources, farming, and transportation facilities.

History and Development

Gilchrist County was established on December 4, 1925, by the Florida Legislature from a part of western Alachua County. The population of Gilchrist County at that time was slightly more than 4,000.

The earliest known kinds of wildlife in the county

included the saber-toothed tiger, mastodons, camels, and raccoons the size of bears. The Raeford Thomas Farm, in the northern part of the county, has provided scientists with a rich store of fossilized bones. This geological site has become nationally known.

The earliest European visitors to the county were the Spanish soldiers accompanying the explorer Panfilo de Narvaez. In 1528, Narvaez crossed the Suwannee River near Fanning Springs en route from Tampa to St. Marks on Apalachee Bay. Hernando de Soto, another Spanish explorer, led a group of soldiers through the survey area on his way from the Tampa Bay area to Tallahassee.

Florida was claimed by Spain until 1763, when it was traded to England. The British ruled from 1763 until 1783, when England returned Florida to Spain. During these early years, Indians also inhabited and claimed the area. Spain ceded Florida to the United States in 1821 without the consent of the Indians. In 1823, a peace treaty was signed between the Indians and the United States.

The resistance of the Seminole Indians to being removed from northern Florida led to the Seminole Indian Wars. In 1842, after the wars ended, Congress passed a homestead act, which encouraged settlers to move into Gilchrist County *(9)*.

Early established towns included Fanning Springs, Yular, Wannee, Willeford, Bell, and Trenton. Other settlements in the county were Blitchville, Frankland, Lottieville, and Tyler. Trenton was named by a Confederate soldier, Ben Boyd, to honor his Tennessee home. Many of these towns had their own schools. Today, there are schools only at Bell and Trenton.

Railroads played a large role in developing the communities in the county. The train "Peggy" ran daily between Starke and Wannee. This railroad line was built through Bell in 1903. Railroads were the main means of transporting farm products, lumber, lime rock, and passengers.

The development of the automobile influenced the improvement of roads and the construction of new highways. The need for railroads diminished as a result of this development. Most of the tracks within the county have been removed, and most of the small towns and settlements adjoining the railroads have disappeared.

The main economic enterprises in the county are the production of field crops, specialty crops, and timber; cattle ranching; horse breeding; and recreational facilities. The Lancaster Correctional Institute also is a source of employment.

Climate

Charles L. Jordon, state climatologist, Department of Meteorology, Florida State University, prepared this section.

Gilchrist County has a moderate climate. Summers are long, hot, and humid. Winters, although punctuated by periodic invasions of cool or cold air from the north, are mild because the county is in the southern latitudes and is a short distance from the relatively warm ocean waters.

Mean annual precipitation in Gilchrist County is 52.84 inches. October and November are the driest months. About 52 percent of the annual rainfall occurs in the summer. The remaining 48 percent is evenly distributed throughout the rest of the year. About once in 10 years, however, an excessive rainfall occurs in the spring. Spring storms have caused rivers to overflow their banks. Heavy summer thundershowers can produce 2 or 3 inches of rainfall in 1 or 2 hours. Daylong rains in the summer are rare. They generally occur in conjunction with tropical storms. The average relative humidity is about 75 percent.

Hail falls occasionally during thundershowers, but the hailstones generally are small and seldom cause much damage. Snow is very rare and usually melts as it reaches the ground.

Tropical storms can affect the survey area at anytime from early June through November. Because it is inland, Gilchrist County is influenced only by the fringe effects of tropical storms. These effects include moderately high wind velocities, several days of overcast skies, and some rainfall.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Gainesville, Florida, in the period 1951 to 1974. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring.

Geomorphology

Frank R. Rupert, geologist, Florida Department of Natural Resources, Florida Geological Survey, prepared this section and the sections on stratigraphy, ground water, and mineral resources.

Gilchrist County lies along the northern edge of the Midpeninsular Zone. This zone spans the Florida peninsula from the lower edge of the topographically higher Northern Highlands southward to the Caloosahatchee River. The Midpeninsular Zone consists of a series of elevationally differentiated geomorphic subzones *(25)*. The two subzones that occur within Gilchrist County are the Gulf Coastal Lowlands and the Central Highlands (fig. 2).

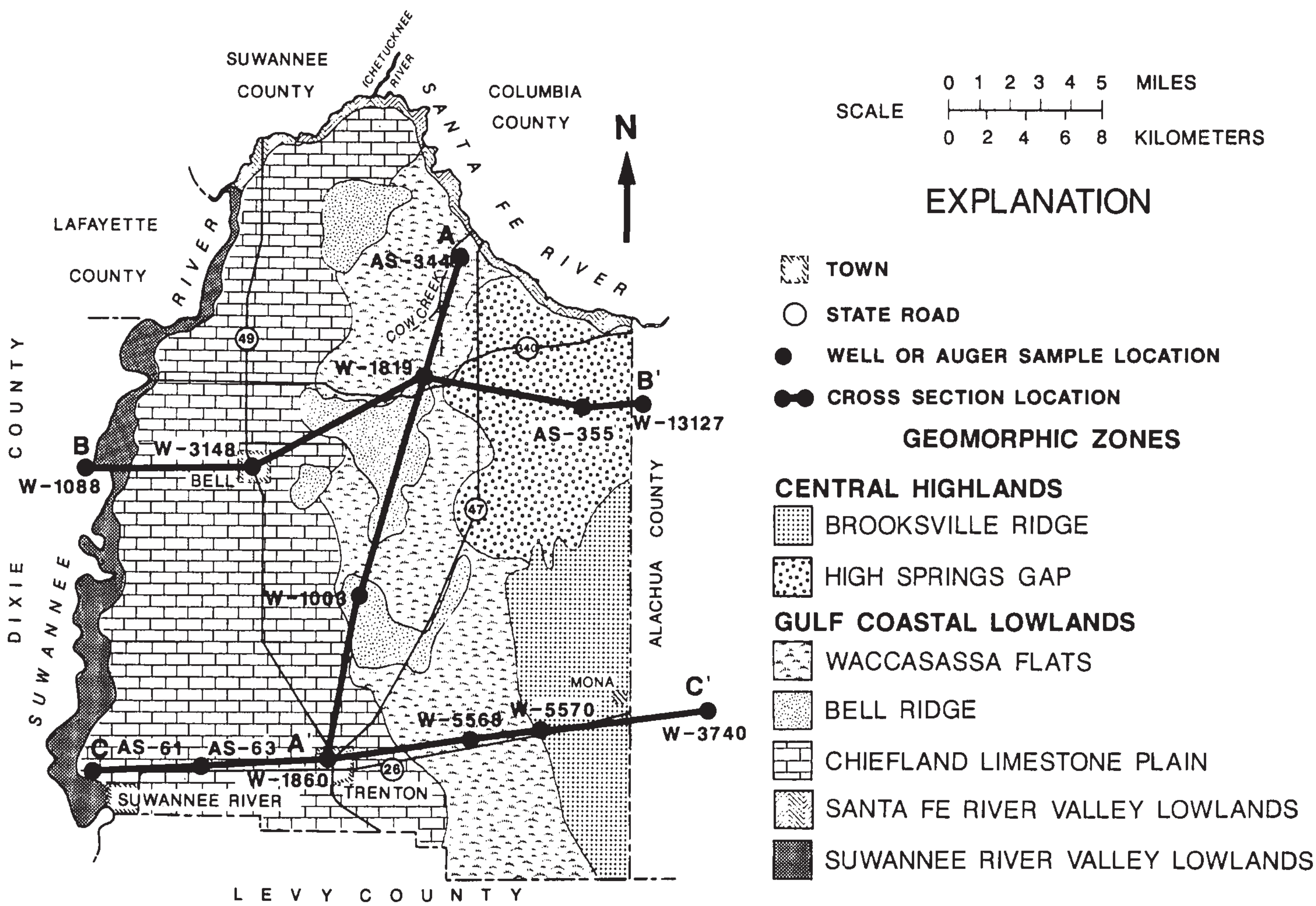

Figure 2.—The geomorphic zones in Gilchrist County.

Gulf Coastal Lowlands

The Gulf Coastal Lowlands parallel the Gulf Coast of Florida northward from Ft. Myers and westward to the Alabama line. In the vicinity of Gilchrist County, this geomorphic province extends from the shoreline of the Gulf of Mexico to some 50 miles inland and terminates at the western edge of the Brooksville Ridge and High Springs Gap. The Gulf Coastal Lowlands are characterized by broad, flat marine plains underlain by Eocene limestones and blanketed by thin layers of sandy material of Pleistocene age (1 million to 10 thousand years before the present). The sandy material was deposited by the regressing Gulf of Mexico. Elevations within the province range from approximately 20 feet above mean sea level (m.s.l.) in westernmost Gilchrist County to more than 100 feet above m.s.l. in the eastern part of the county. The Gulf Coastal Lowlands in Gilchrist County have several geomorphic subdivisions based on topography. The subdivisions include the Waccasassa Flats, the Bell Ridge, the Chiefland Limestone Plain, the Santa Fe River Valley Lowlands, and the Suwannee River Valley Lowlands *(12)*.

Waccasassa Flats.—This geomorphic province is a low, swampy area about 5 miles wide and 25 miles long. It originates at the south bank of the Santa Fe River and extends southward through central Gilchrist County and southeastward into Levy County. Elevations average about 60 feet above m.s.l. throughout most of the flats. Isolated sandhills, however, that are possibly associated with the Bell and Brooksville Ridges, reach an elevation of 90 to 100 feet above m.s.l. A structural low that is filled with siliciclastics of Miocene age (5 to 25 million years before the present) and Pleistocene age underlies the Waccasassa Flats. Although no apparent relationship exists between the low and the

origin of the flats, the siliciclastics filling the depression may retard the downward percolation of ground water and result in the swampy conditions that are generally throughout this province *(12)*. The flats could be a remnant stream valley, possibly of the ancestral Suwannee River, or they could be of erosional marine origin *(24)*. The predominance of relict marine features throughout the flats supports the theory of marine origin *(12)*.

The Bell Ridge.—This geomorphic province is a 20-mile-long series of irregularly shaped sand ridges that border the eastern edge of the Chiefland Limestone Plain *(24)*. The crests of the ridges range in elevation from 80 to 100 feet above m.s.l. Although their origin is uncertain, the ridges are most likely part of a barrier island system from a relict Wicomico Sea of Pleistocene age *(14)*. The Bell Ridge may be an outlier of the Brooksville Ridge, to which it is roughly parallel *(25)*. The sand ridges of the Bell Ridge directly overlie karstic limestone of Eocene age (37 to 54 million years before the present). The former extent of the contiguous ridge system may be obscured by solution and collapse in the underlying limestone *(12)*.

The Chiefland Limestone Plain.—This geomorphic province consists of a flat, sandy terrain overlying eroded and highly karstic Eocene limestone *(12, 24)* and is in the western third of Gilchrist County. It is bordered on the west by the Suwannee River Valley Lowlands and on the east by the Bell Ridge and Waccasassa Flats. The surface is generally flat to gently rolling, and elevations range from 25 to 65 feet above m.s.l. The surficial sediments are primarily well drained, sandy material of Pleistocene age and average less than 20 feet thick.

The River Valley Lowlands.—This geomorphic province includes the topographically low, broad valleys of the Santa Fe and Suwannee Rivers *(12)*. The valleys are floored with a thin veneer of siliciclastics of Holocene age (10,000 years before the present to the present) over limestone.

The Santa Fe River flows westward from its source in Alachua County and forms the northern boundary of Gilchrist County. In northeastern Gilchrist County, the river is partially entrenched in a limestone channel and meanders through a ½-mile-wide valley. Elevations in the valley range from 20 to 30 feet above m.s.l. The Santa Fe River is fed by several sluggish creeks that flow from the surrounding highly solutional terrain and by the runs from numerous springs. As the river enters the Chiefland Limestone Plain, northwestward from Cow Creek, the valley narrows considerably. Cow Creek, which flows northward out of Gilchrist County, and numerous smaller creeks that drain the Chiefland Limestone Plain are the primary tributaries. Elevations within the valley are between 10 and 20 feet above m.s.l., and much of the valley is swampy. The Ichetucknee River, which flows southward out of Suwannee County, joins the Santa Fe River at the northern tip of Gilchrist County. From the Ichetucknee River westward to its confluence with the Suwannee River, the Santa Fe River flows in a ¼-mile-wide, swampy valley that ranges in elevation from 8 to 20 feet above m.s.l.

The Suwannee River forms the western boundary of Gilchrist County. Its broadly meandering valley ranges in width from less than ¼ mile to nearly 1½ miles. Throughout the river's course along western Gilchrist County, the elevations of the valley floor average 15 feet above m.s.l. In northwestern Gilchrist County, a contour at an elevation of 20 feet above m.s.l. delineates the extent of the Suwannee River Valley Lowlands. Southwestward, near the town of Suwannee River, a contour at an elevation of 10 feet above m.s.l. delineates the valley. The Suwannee River flows southward. It is entrenched in a limestone channel. The valley floor sediments are predominantly reworked Pleistocene and Holocene alluvial sands and muds and include some outcrops of the Ocala Group limestone of Eocene age.

The Central Highlands

The Central Highlands province includes a series of local highlands and ridges and intervening lowland valleys, which generally run parallel to the coast along the central peninsula. The Brooksville Ridge and the High Springs Gap, situated at the eastern edge of Gilchrist County, are two subdivisions of the Central Highlands.

The Brooksville Ridge.—This geomorphic province has its northern terminus along the eastern edge of Gilchrist County *(12)*. This ridge is a topographic highland. It extends southeastward into Pasco County a distance of 110 miles. In Gilchrist County the ridge sediments rest on karstic Eocene limestone. The core of the ridge consists largely of Pleistocene siliciclastics and is capped by a rolling plain of marine terrace sand of Pleistocene age. The plain has many depressions. A well defined marine escarpment borders the western edge of the ridge at an elevation of 70 to 75 feet above m.s.l. and is probably associated with the level of the Wicomico Sea of Pleistocene age *(12)*. Surface elevations are 100 feet above m.s.l. on crests along the eastern edge of Gilchrist County.

High Springs Gap.—This geomorphic lowland is situated in northeastern Gilchrist County, at the northern terminus of the Brooksville Ridge *(13)*. It provides a drainage egress, via the Santa Fe River, between the northernmost limit of the Western Valley geomorphic

zone of the central peninsula and the Gulf Coastal Lowlands zone to the west.

Stratigraphy

The oldest rock penetrated by wells in Gilchrist County is limestone of the Avon Park Formation of Eocene age. Undifferentiated surficial sands and clayey sands of Pleistocene to Holocene age are the youngest sediments. The Avon Park Formation and the younger limestone overlying it are important freshwater aquifers. The paragraphs that follow describe the sediments of Eocene age and younger.

Eocene Series

Avon Park Formation.—This formation is a lithologically variable carbonate unit of Middle Eocene age that underlies all of Gilchrist County *(11)*. The formation is typically a tan to brown dolomite that is commonly interbedded with white to yellowish gray limestones and dolomitic limestones of varying hardness *(13)*. Mollusks and foraminifera are the dominant fossils. The Avon Park Formation is a component of the Floridan aquifer system. According to Florida Geological Survey in-house well data, the top of this formation underlies Gilchrist County at a depth of 115 to 145 feet. Well number W-1003, which is 4 miles southeast of Bell, is the only well to penetrate the entire section of the Avon Park Formation. The core data from this well indicate that the formation is 850 feet thick in this part of the county.

Ocala Group.—This group consists of marine limestones that unconformably overlie the Avon Park Formation in all of Gilchrist County *(12)*. In ascending order, the Ocala Group consists of the Inglis Formation, the Williston Formation, and the Crystal River Formation. These formations are differentiated on the basis of lithology and fossil content. Typically, the lithology of the Ocala Group grades from the alternating hard and soft, white to gray, fossiliferous and dolomitic limestones of the Inglis Formation and the lower Williston Formation to the white to cream, abundantly fossiliferous, chalky limestones of the upper Williston Formation and the Crystal River Formation. Foraminifera, mollusks, bryozoans, and echinoids are the dominant fossils in sediments of the Ocala Group.

The thickness of the Ocala Group sediments in Gilchrist County averages about 100 feet. According to Florida Geological Survey in-house lithologic files, depth to the irregular, karstic surface of the unit ranges from 5 feet in the Chiefland Limestone Plain province in western Gilchrist County to more than 80 feet in the structural low under the Waccasassa Flats. Because erosion has removed the Crystal River Formation in portions of the county, the Williston Formation is the uppermost Ocala Group unit encountered in some wells. A series of faults in western Gilchrist County and a large graben trending north-south under the Waccasassa Flats may have further modified the surface of the karstic Ocala Group *(12)*.

Because of their permeable and cavernous nature, the Ocala Group limestones are important freshwater-bearing units of the Floridan aquifer system. Many wells in Gilchrist County draw drinking water from the upper units of this group.

Miocene Series

Alachua Formation.—This formation is a complex unit. It was originally defined as only the sand and clay infillings in the older karst depressions or stream channels *(6)*. The formation was later considered to be a mixture of discontinuous, interbedded clay, sand, and sandy clay, including commercially important phosphatic sand and gravel deposits *(13, 24)*. In Gilchrist County the Alachua Formation sediments vary greatly in lithology. Typically, this unit consists of gray, poorly indurated, fine quartz sands in a matrix of phosphatic clay. The sands are interbedded with or underlain by pebbles of waterworn flint; erratic limestone boulders; silicified limestone and chert; light blue and green, waxy montmorillonite clay lenses; pebbles and boulders of phosphate rock conglomerate; colloidal phosphate; and some concentrations of vertebrate fossils *(12)*.

The phosphate rock is a minor constituent of the Alachua Formation. Mining this rock was economically feasible for many years. The rock occurs in various modes, including clay to boulder-size clasts and replacements of limestone and laminated phosphate (plate rock). Because the Alachua Formation was deposited on the eroded, highly karstic, and possibly faulted surface of the Ocala Group limestones, its thickness varies considerably over relatively short distances. With the exception of some fill deposits in deep sinkholes, the formation does not occur in westernmost Gilchrist County. A sequence of Alachua Formation sediments, approximately 80 to 100 feet thick, is in the structural low in central Gilchrist County. To the east of this, a discontinuous series of sediments 10 to 20 feet thick underlies the High Springs Gap and the Brooksville Ridge.

The origin and age of the Alachua Formation are uncertain. According to one theory, the formation is an in situ accumulation of weathered Hawthorn Group sediments of Miocene age *(5)*. According to another theory, the formation originated as a largely terrestrial deposit consisting of lacustrine and fluviatile components *(13)*. One suggestion is that it was deposited in an estuarine environment *(3)*. According to

a more recent theory, the Alachua Formation is weathered and possibly reworked Hawthorn Group sediments but is not part of the Hawthorn Group *(15)*.

An age range of Miocene to Pleistocene, based primarily on vertebrate fossils, has been postulated for the Alachua Formation. This wide range tends to support the concept that the Alachua Formation consists of time-transgressive, reworked sediments in which younger vertebrate fauna were incorporated during each successive deposition.

Pleistocene Series

Much of the core of the Brooksville Ridge in Gilchrist County consists of reddish, clayey coarse sands. The sands are lithologically similar to those of the Citronelle Formation of the Panhandle and the Cypresshead Formation of peninsular Florida, which are both considered to be of the lower Pleistocene age. For the purposes of this survey, these variably colored red, orange, and pink siliciclastics, some of which contain fossil burrows, are considered undifferentiated Pleistocene sediments.

Undifferentiated Pleistocene marine quartz sands and clayey sands form a thin veneer over all of Gilchrist County. In the western part of the county, these sands are generally less than 20 feet thick and directly overlie the Ocala Group limestone. In central and eastern Gilchrist County, they cap reddish coarse clastics and the Alachua Formation. Many of the larger and higher sand bodies in the county are relict dunes, bars, and barrier islands associated with various Pleistocene stands at sea level. The higher crests on the Brooksville Ridge, more than 100 feet above m.s.l., are associated with the Sunderland and Okefenokee terraces *(8)*. With the exception of the Suwannee River Valley Lowlands, which is part of the Pamlico Terrace, the surficial siliciclastic sediments that occur throughout the rest of Gilchrist County are Wicomico terrace deposits *(8)*.

Holocene Series

A white to gray, fossiliferous, freshwater marl commonly occurs along the banks and in the valleys of the Santa Fe and Suwannee Rivers. This marl generally contains an abundant freshwater mollusk fauna of Holocene age and can range to 4 feet in thickness *(12)*.

Ground Water

Ground water fills the pore spaces in subsurface rocks and sediments. In Gilchrist County and adjoining counties, it is derived mainly from precipitation. Most of the water consumed in Gilchrist County is drawn from ground-water aquifers. The main aquifer systems in Gilchrist County are the surficial aquifer system and the underlying Floridan aquifer system *(17)*.

Surficial aquifer system.—This aquifer system is the highest freshwater aquifer in Gilchrist County. It is nonartesian and is contained within the interbedded sands and clays of the Alachua Formation and the overlying Pleistocene siliciclastics and marine terrace sands in the central and southeastern parts of the county. In the western part of the county, where the Alachua Formation does not occur, the surficial aquifer system may be perched in locally thick Pleistocene sands that directly overlie the Ocala Group limestone. In these areas the surficial aquifer system is separated from the underlying Floridan aquifer system by zones of unsaturated lime rock *(10)*.

Generally, the surficial aquifer system ranges from 10 to 80 feet in thickness. The thicker portions are located under the higher geomorphic sand ridges of central and eastern Gilchrist County and in the structural low under the Waccasassa Flats. The surficial aquifer system is unconfined, and its upper surface is the water table. Generally, the elevation of the water table fluctuates with the precipitation rate and conforms to the topography of the land surface. The surficial aquifer system is largely recharged through rainfall that percolates downward through the loose surficial clastic sediments and, to a lesser extent, through upward seepage from the underlying Floridan aquifer system. Water naturally discharges from the aquifer through evaporation, transpiration, spring flow, and downward seepage into the Floridan aquifer system. The surficial aquifer system may yield quantities of water suitable for consumption, but in some areas concentrations of iron and tannic acid can impart a poor taste and color to the water *(10)*.

Floridan aquifer system.—This aquifer system is made up of several hundred feet of Eocene-age marine limestone, including the Avon Park Formation and the Ocala Group. It is the principal source of drinking water in Gilchrist County. It occurs as an unconfined, nonartesian aquifer in portions of western, northern, and northeastern Gilchrist County, where porous Pleistocene quartz sand directly overlies the limestone. In areas of central and southeastern Gilchrist County, where clay beds in the Alachua Formation form confining units that are slowly permeable, the Floridan may function as an artesian aquifer. Depth to the top of the Floridan aquifer generally corresponds to the depth to limestone. It ranges from less than 5 feet in the valleys of the Suwannee and Santa Fe Rivers to nearly 80 feet under the Waccasassa Flats. The piezometric gradient is generally west-southwestward.

The Floridan aquifer system in Gilchrist County is recharged by the percolation of rainfall through the permeable surficial sands in the western and

northeastern portions of the county. The thick sequence of slowly permeable clastics under the Waccasassa Flats retards downward percolation and results in only low or moderate recharge in this area *(18)*. Water leaves the Floridan aquifer through natural downgradient movement and subsequent discharge through springs and seeps along the river valley lowlands.

Mineral Resources

At present, no mineral commodities are being mined on a commercial basis in Gilchrist County. Hard rock, colloidal phosphate, and high-purity limestone, however, have been mined in the past. The following discussion of the major mineral commodities is intended to provide an overview of the mining potential of each mineral.

Sand

A number of shallow private pits in Gilchrist County are mined for fill sand. These sand deposits are concentrated in the unconsolidated Pleistocene-age surficial sands covering most of the county. Since the local demand for sand products is insufficient, the potential for commercial mining is low at this time.

Phosphate

Phosphatic sands, clays, and limestones of the Alachua Formation have been mined in eastern Gilchrist County since the 1900's. Hard rock phosphate, a calcium phosphate-fluorapatite mixture, occurs as a replacement of limestone float contained in basal Alachua Formation sediments and on the top of the Ocala Group. The clays within the Alachua Formation contain colloidal phosphate and phosphorite and make up what is termed soft rock phosphate.

No commercial phosphate mines are in operation in Gilchrist County today. A company mined soft rock phosphate as late as 1973 in an area directly south of Mona. A large area of eastern Gilchrist County, along the Gilchrist-Alachua County line and corresponding to the Brooksville Ridge, has commercial mining potential. Future exploitation of these remaining deposits will depend largely on the market prices of phosphate and the economic stability of the phosphate industry.

Limestone

Ocala Group limestones are near the surface in western Gilchrist County. These high-purity limestones approach 95 percent calcium carbonate. Commercially mineable deposits are extensive, but no commercial limestone quarries are in operation in the county. The Gilchrist County Road Department, however, is currently operating an open-pit lime rock mine located off State Road 49, north of Bell. The rock is mechanically extracted, crushed, and used as roadbase material by the county.

Farming

The land in Gilchrist County is generally used as cropland or woodland. The main crops are corn, tobacco, soybeans (fig. 3), peanuts, watermelon, small grain, and a few vegetables. Most of the cropland is in the western and eastern parts of the county.

Most of the soils in Gilchrist County that are used for crops are deep, droughty sands that are subject to soil blowing and water erosion. Historically, deep plowing and clean cultivation have been used in the county. Gully-control structures, grassed waterways, windbreaks, and a permanent vegetative cover are needed to control erosion.

The only soil in Gilchrist County that meets all of the requirements for prime farmland as defined by the U.S. Department of Agriculture is the Eunola soil in the map unit Eunola-Bonneau fine sands, 0 to 5 percent slopes. The other soils in the county are too wet because of a seasonal high water table or flooding or are too droughty during the growing season.

The enactment of legislation in 1937 to create soil conservation districts stirred the interest of many landowners in Gilchrist County. The Gilchrist County Soil and Water Conservation District promotes farming, tree planting, and other agricultural practices. Its goal is to assist farmers, public agencies, and other land users with problems related to soil and water conservation. This soil survey is part of that assistance.

Transportation Facilities

In Gilchrist County many county, state, and federal highways facilitate the transport of goods from farm to market. U.S. 19 crosses the Suwannee River in the southwestern part of the county at Fanning Springs. U.S. 129 runs north and south through Bell and Trenton. Large tractor-trailers carry timber and other products. Rail service also is available within the county.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; the kinds of

Figure 3.—Soybeans in an area of Otela-Penney fine sands, 0 to 5 percent slopes.

crops and native plants growing on the soils; and the kinds of bedrock. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material has few or no roots or other living organisms and has been changed very little by other biological activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, landforms, relief, climate, and natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with a considerable degree of accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, reaction, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes (units). Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the

same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpret the data from these analyses and tests as well as the field-observed characteristics and the soil properties to determine the expected behavior of the soils under different uses. Interpretations for all of the soils are field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and some new interpretations are developed to meet local needs. Data are assembled from other sources, such as research information, production records, and field experience of specialists. For example, data on crop yields under defined levels of management are assembled from farm records and from field or plot experiments on the same kinds of soil.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can predict with a fairly high degree of accuracy that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows broad areas that have a distinctive pattern of soils, relief, and drainage. Each map unit on the general soil map unit is a unique natural landscape. Typically, it consists of one or more major soils and some minor soils. It is named for the major soils. The soils making up one unit can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one map unit differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The soils in the survey area vary widely in their suitability for major land uses. Table 3 shows the extent of the map units shown on the general soil map. It also shows the soil properties that limit major land uses. Each map unit is rated for *crops, pasture, planted pines, sanitary facilities, building site development,* and *recreational areas*. Cultivated crops are those grown extensively in the county. Pasture refers to areas of the tame pasture grasses commonly grown in the county. Recreational areas include campsites, picnic areas, playgrounds, and other areas that are subject to heavy foot traffic.

Soils in Sandy Areas on Uplands

These are excessively drained and well drained, nearly level to moderately sloping soils on uplands. Most are sandy throughout. Some have loamy material between depths of 40 and 80 inches. The soils are in the eastern part of the county, adjoining Alachua County, and in the northwestern part, between the Waccasassa Flats and the flood plain along the Suwannee River.

1. Alpin-Wadley

Nearly level and gently sloping, excessively drained and well drained soils that are sandy throughout or have a sandy surface layer and subsurface layer and a loamy subsoil

This map unit is on broad uplands. Most areas are in the eastern part of the county, adjacent to the Alachua County line. The unit makes up about 13,600 acres, or 6 percent of the county. It is about 70 percent Alpin soils, 10 percent Wadley soils, and 20 percent soils of minor extent.

The landscape is interspersed with sharp-breaking, long and narrow steeper slopes and with sinkholes. The natural vegetation is turkey oak, bluejack oak, post oak, live oak, laurel oak, laurelcherry, and scattered pine. The understory consists mainly of pineland threeawn, indiangrass, chalky bluestem, greenbriar, and panicum.

Alpin soils are excessively drained. Typically, the surface layer is dark gray fine sand. The underlying material to a depth of 80 inches or more is fine sand. The upper part is light yellowish brown and very pale brown. The lower part is very pale brown and has thin layers of yellowish brown loamy fine sand.

Wadley soils are well drained. Typically, the surface layer is dark grayish brown fine sand. The subsurface layer is fine sand. The upper part is pale brown, the next part is brownish yellow, and the lower part is very pale brown. The upper part of the subsoil is strong brown sandy clay loam. The lower part to a depth of 80 inches or more is light yellowish brown sandy loam.

Minor in this map unit are Albany, Blanton, Bonneau, Ortega, Otela, Penney, and Ridgewood soils. Blanton, Bonneau, Ortega, Otela, and Penney soils are at the higher elevations. Albany and Ridgewood soils are in the slightly lower, wetter areas.

Most of the acreage is used as woodland or pasture. A few areas are used for urban development. In most areas this map unit is poorly suited to crops, moderately well suited to pasture, and well suited to pine trees.

Droughtiness and rapid leaching of plant nutrients are the main limitations affecting plant growth. The unit is well suited to urban development.

2. Penney-Kershaw

Nearly level to moderately sloping, excessively drained soils that have thin lamellae of loamy fine sand in the lower part of the underlying material or are sandy throughout

This map unit is on broad uplands. Most areas are in the eastern part of the county, adjacent to the Alachua County line, but one area is in the northwestern part. The unit makes up about 86,000 acres, or 38 percent of the county. It is about 70 percent Penney soils, 11 percent Kershaw soils, and 19 percent soils of minor extent.

The landscape is interspersed with sharp-breaking, long and narrow steeper slopes and with sinkholes. The natural vegetation is turkey oak, bluejack oak, post oak, sand live oak, and a few longleaf pine trees. The understory consists mainly of pineland threeawn, indiangrass, chalky bluestem, and panicum.

Typically, the surface layer of the Penney soils is dark grayish brown fine sand. The underlying material to a depth of 80 inches or more is fine sand. The upper part is pale brown. The lower part is very pale brown and has thin lamellae of yellowish brown loamy fine sand.

Typically, the surface layer of the Kershaw soils is very dark grayish brown fine sand. The underlying layers to a depth of 80 inches or more are pale brown and very pale brown fine sand.

Minor in this map unit are Albany, Blanton, Ortega, Otela, Shadeville, and Wadley soils. Blanton, Ortega, and Wadley soils are at the higher elevations. Albany soils are in the slightly lower, wetter areas. Shadeville and Otela soils are in areas where the underlying bedrock is limestone.

Most of the acreage is used as woodland. Some areas are used as pasture. A few areas are used for urban development. In most areas this map unit is poorly suited to crops and moderately well suited to pasture and to pine trees. Droughtiness and rapid leaching of plant nutrients are the main limitations affecting plant growth. The unit is well suited to urban development.

Soils on Slight Knolls and Uplands

These are excessively drained, well drained, and moderately well drained, nearly level and gently sloping soils. Most are sandy in the upper part and loamy in the lower part. Some are sandy throughout. The soils are in the southwestern part of the county, between the Waccasassa Flats and the Suwannee River.

3. Bonneau-Blanton-Eunola

Nearly level and gently sloping, moderately well drained soils that have a sandy surface layer and subsurface layer and a loamy subsoil

This map unit is on uplands. It is in the south-central part of the county. It makes up about 9,000 acres, or 4 percent of the county. It is about 36 percent Bonneau soils, 30 percent Blanton soils, 20 percent Eunola soils, and 14 percent soils of minor extent.

This map unit is in upland areas interspersed with sinkholes. The depth to limestone bedrock varies. The natural vegetation is live oak, laurel oak, post oak, water oak, hickory, laurelcherry, slash pine, loblolly pine, and longleaf pine. The understory consists mainly of lopsided indiangrass, panicum, greenbriar, hawthorn, persimmon, fringeleaf paspalum, hairy tickclover, dwarf huckleberry, bluestems, and pineland threeawn.

Typically, the surface layer of the Bonneau soils is very dark grayish brown fine sand. The subsurface layer is fine sand. The upper part is light yellowish brown, and the lower part is very pale brown. The subsoil to a depth of 80 inches or more is sandy clay loam. The upper part is yellowish brown and light yellowish brown, and the lower part is mottled gray, yellowish brown, and strong brown.

Typically, the surface layer of the Blanton soils is very dark grayish brown fine sand. The subsurface layer is fine sand. The upper part is light yellowish brown, and the lower part is very pale brown. The upper part of the subsoil is yellowish brown sandy loam, and the lower part to a depth of 80 inches or more is yellowish brown sandy clay loam that has mottles in shades of gray and red.

Typically, the surface layer of the Eunola soils is very dark grayish brown fine sand. The subsurface layer is pale brown fine sand. The upper part of the subsoil is yellowish brown fine sandy loam, the next part is yellowish brown sandy clay loam, and the lower part is mottled fine sandy loam. The substratum to a depth of 80 inches or more is light gray fine sandy loam.

Minor in this map unit are Albany, Shadeville, Ortega, and Wadley soils. These soils generally occur as small areas mixed with the major soils.

This map unit is used for agricultural purposes and urban development. In most areas it is moderately well suited to crops and well suited to pasture and pine trees. Droughtiness and rapid leaching of plant nutrients are the main limitations affecting plant growth. The unit is well suited to urban development.

4. Penney-Otela

Nearly level and gently sloping, excessively drained and moderately well drained soils that are sandy and have thin lamellae of loamy fine sand in the lower part of the underlying material or have a sandy surface layer and subsurface layer and a loamy subsoil

This map unit is on uplands. Most areas are on the highly complex limestone plain in the southwestern part of the county. The unit makes up about 34,000 acres, or 15 percent of the county. It is about 48 percent Penney soils, 22 percent Otela soils, and 30 percent soils of minor extent.

The landscape is interspersed with sinkholes throughout. The depth to limestone bedrock varies. The natural vegetation is laurel oak, live oak, turkey oak, bluejack oak, slash pine, longleaf pine, and scattered palmettos. The understory consists mainly of pineland threeawn, lopsided indiangrass, panicum, and chalky bluestem.

Penney soils are excessively drained. Typically, the surface layer is dark grayish brown fine sand. The underlying material to a depth of 80 inches or more is fine sand. The upper part is pale brown and very pale brown. The lower part is very pale brown and has thin lamellae of yellowish brown loamy fine sand.

Otela soils are moderately well drained. Typically, the surface layer is dark grayish brown fine sand. The upper part of the subsurface layer is light yellowish brown fine sand. The lower part is very pale brown fine sand that has thin lamellae of sandy loam. The subsoil to a depth of 80 inches or more is light yellowish brown and light gray sandy clay loam.

Minor in this map unit are Blanton, Bonneau, Ortega, Shadeville, and Wadley soils. These soils occur as small areas mixed with the major soils.

Most of the acreage is used as cropland. Some areas are used as pasture. A small acreage is used as woodland. In most areas this map unit is poorly suited to crops and moderately well suited to pasture and to pine trees. Droughtiness and rapid leaching of plant nutrients are the main limitations affecting plant growth. The unit is well suited to urban development.

5. Wadley-Blanton

Nearly level and gently sloping, well drained and moderately well drained soils that have a sandy surface layer and subsurface layer and a loamy subsoil

This map unit is in the uplands. Most areas are in the southwestern part of the county, but one small area is in the southeastern part. The unit makes up about 6,800 acres, or 3 percent of the county. It is about 40 percent Wadley soils, 35 percent Blanton soils, and 25 percent soils of minor extent.

The landscape is interspersed with sinkholes throughout. The natural vegetation is live oak, laurel oak, post oak, water oak, laurelcherry, sweetgum, slash pine, loblolly pine, and longleaf pine. The understory consists mainly of a sparse cover of pineland threeawn, indiangrass, chalky bluestem, greenbriar, hairy panicum, hawthorn, persimmon, fringeleaf paspalum, hairy tickclover, and dwarf huckleberry.

Wadley soils are well drained. Typically, the surface layer is dark grayish brown fine sand. The subsurface layer is fine sand. The upper part is pale brown and brownish yellow, and the lower part is very pale brown. The upper part of the subsoil is strong brown sandy clay loam. The lower part to a depth of 80 inches or more is light yellowish brown sandy loam.

Blanton soils are moderately well drained. Typically, the surface layer is dark gray fine sand. The subsurface layer is fine sand. The upper part is light yellowish brown, and the lower part is very pale brown. The upper part of the subsoil is brownish yellow sandy clay loam. The lower part to a depth of 80 inches or more is gray sandy clay loam that has mottles in shades of red and yellow.

Minor in this map unit are Albany, Bonneau, Penney, and Ridgewood soils. Penney soils are on high sandy ridges. Bonneau soils are on slight knolls. Albany and Ridgewood soils are on the lower broad flats.

Most of the acreage is used as cropland or pasture. A small acreage is wooded. A few areas are used for urban development. In most areas this map unit is poorly suited to crops, moderately well suited to pasture (fig. 4), and well suited to pine trees. Droughtiness and rapid leaching of plant nutrients are the main limitations affecting plant growth. The unit is moderately well suited to urban development.

Soils in Depressions, on Flatwoods, on Slight Knolls, and in Transitional Areas Between the Uplands and Flatwoods

These are moderately well drained to poorly drained, nearly level and gently sloping soils. Some are sandy throughout. Some have a sandy subsoil in which the sand grains are coated with organic matter. Some are loamy below the layers that have coatings on the sand grains. The soils border the Waccasassa Flats and are on the flats.

Figure 4.—Pasture of bahiagrass in an area of the Wadley-Blanton general soil map unit.

6. Lynn Haven-Ridgewood

Nearly level, very poorly drained and somewhat poorly drained soils that have a sandy surface layer and a sandy subsoil coated with organic material or that are sandy throughout

This map unit is in depressions and in the broad flatwoods. It is on the Waccasassa Flats, which are in the central part of the county. The unit makes up about 23,000 acres, or about 10 percent of the county. It is about 40 percent Lynn Haven and similar soils, 35 percent Ridgewood soils, and 25 percent soils of minor extent.

The landscape is interspersed with cypress ponds, swamps, small depressions that are grassy and wet, and slight knolls that support pines, oaks, and scattered palmettos. The natural vegetation is cypress, blackgum, sweetbay, red maple, and swamp tupelo in the depressions and water oak, laurel oak, live oak, slash pine, longleaf pine, waxmyrtle, sumac, blackberry gallberry, saw palmetto, carpetgrass, and pineland threeawn in the flatwoods.

Lynn Haven soils are very poorly drained. Typically, the upper part of the surface layer is black mucky fine sand, and the lower part is very dark gray fine sand. The subsurface layer is grayish brown fine sand. The subsoil to a depth of 80 inches or more is black and dark brown fine sand.

Ridgewood soils are somewhat poorly drained. Typically, the surface layer is dark gray fine sand. The underlying material to a depth of 80 inches or more is fine sand. The upper part is light yellowish brown and has light brownish gray mottles, the next part is light brownish gray, and the lower part is light gray.

Of minor extent in this unit are Albany, Allanton, Dorovan, Hurricane, Ortega, Osier, Pamlico, Pottsburg, Sapelo, and Surrency soils. Also of minor extent are Leon soils that are not subject to flooding and Leon soils that are frequently flooded. Albany, Hurricane, and Ortega soils are on knolls in the flatwoods. Pottsburg and Sapelo soils and the Leon soils that are not subject to flooding are in nearly level areas in the flatwoods. The frequently flooded Leon soils are in drainageways. Allanton, Dorovan, Osier, Pamlico, and Surrency soils are in depressions.

Most of the acreage is used as woodland. In most areas this map unit is poorly suited to crops and moderately well suited to pasture and pine trees. Wetness, flooding, and ponding are the main limitations affecting plant growth. The unit is poorly suited to urban development.

7. Ortega-Ridgewood

Nearly level and gently sloping, moderately well drained and somewhat poorly drained soils that are sandy throughout

This map unit is in transitional areas between the uplands and the flatwood areas of the Waccasassa Flats, in the central part of the county. The unit makes up about 18,000 acres, or 8 percent of the county. It is about 45 percent Ortega soils, 30 percent Ridgewood soils, and 25 percent soils of minor extent.

The landscape is interspersed with a few cypress ponds, swamps, and small depressions that are grassy and wet. Some of the depressional areas are connected by narrow drainageways. The natural vegetation is live oak, laurel oak, post oak, turkey oak, water oak, laurelcherry, slash pine, loblolly pine, and longleaf pine. The understory consists mainly of lopsided indiangrass, hairy panicum, low panicum, greenbriar, hawthorn, persimmon, fringeleaf paspalum, hairy tickclover, dwarf huckleberry, chalky bluestem, creeping bluestem, and pineland threeawn.

Ortega soils are moderately well drained. Typically, the surface layer is very dark grayish brown fine sand. The underlying material to a depth of 80 inches or more is fine sand. The upper part is brown, the next part is pale brown, and the lower part is light gray.

Ridgewood soils are somewhat poorly drained. Typically, the surface layer is dark gray fine sand. The underlying material to a depth of 80 inches or more is fine sand. The upper part is light yellowish brown and has light brownish gray mottles, the next part is light brownish gray, and the lower part is light gray.

Minor in this map unit are Albany, Blanton, Hurricane, and Penney soils. Albany and Hurricane soils are on slight knolls. Blanton and Penney soils are on the higher sandy ridges in the uplands.

Most of the acreage is used as pasture. A small acreage is wooded. A few areas are used for urban development. In most areas this map unit is poorly suited to crops, well suited to pasture, and moderately well suited to pine trees. Droughtiness and rapid leaching of plant nutrients are the main limitations affecting plant growth. The unit is poorly suited to urban development.

8. Wesconnett-Lynn Haven-Ridgewood

Nearly level and gently sloping, very poorly drained and somewhat poorly drained soils that have a sandy surface layer and a sandy subsoil coated with organic material or that are sandy throughout

This map unit is in the flatwoods. Most areas are in the southeastern part of the county. The unit makes up about 16,000 acres, or 7 percent of the county. It is about 30 percent Wesconnett soils, 25 percent Lynn Haven and similar soils, 20 percent Ridgewood soils, and 25 percent soils of minor extent.

The landscape is interspersed with cypress ponds, swamps, small depressions that are grassy and wet, and slight knolls that support pines, oaks, and scattered palmettos. The natural vegetation is cypress, blackgum, sweetbay, red maple, and swamp tupelo in the depressions and water oak, laurel oak, live oak, slash pine, and longleaf pine on the slight knolls. The understory consists mainly of waxmyrtle, sumac, blackberry, gallberry, saw palmetto, carpetgrass, and pineland threeawn.

Westconnett soils are very poorly drained. Typically, the surface layer is black mucky fine sand. The subsoil to a depth of more than 80 inches is fine sand. The upper part is very dark brown, the next part is dark brown and brown, and the lower part is black. The sand grains in the upper and lower parts are coated with organic matter.

Lynn Haven soils are very poorly drained. Typically, the upper part of the surface layer is black mucky fine sand, and the lower part is very dark gray fine sand. The subsurface layer is grayish brown fine sand. The subsoil to a depth of 80 inches or more is black and dark brown fine sand.

Ridgewood soils are somewhat poorly drained. Typically, the surface layer is dark gray fine sand. The underlying material to a depth of 80 inches or more is fine sand. The upper 19 inches is light yellowish brown and has light brownish gray mottles, the next 15 inches is light brownish gray, and the lower 40 inches is light gray.

Minor in this map unit are Albany, Hurricane, Leon, Ortega, Pottsburg, and Sapelo soils. Albany, Hurricane, and Ortega soils are on slight knolls. Leon, Pottsburg, and Sapelo soils are on broad flats.

Most of the acreage is used as woodland. Some small areas have been cleared and are used as pasture. In most areas this map unit is poorly suited to crops, pasture, and planted pine trees. Seasonal wetness and droughtiness are the limitations affecting plant growth. The unit is poorly suited to urban development.

9. Leon-Wesconnett-Sapelo

Nearly level, poorly drained and very poorly drained soils that are sandy throughout and have a subsoil coated with organic material or that have a sandy surface layer and subsurface layer, a sandy subsoil, and a loamy substratum

This map unit is in the flatwoods. Most areas are in the south-central part of the county. The unit makes up

about 11,000 acres, or 5 percent of the county. It is about 60 percent Leon soils, 20 percent Wesconnett soils, 10 percent Sapelo soils, and 10 percent soils of minor extent.

The landscape is interspersed with a few slight knolls, cypress ponds, swamps, and small depressions that are grassy and wet. Some of the depressional areas are connected by narrow drainageways. The natural vegetation in the flatwoods is mainly slash pine and longleaf pine. The understory consists mainly of saw palmetto, running oak, gallberry, waxmyrtle, huckleberry, greenbrier, pineland threeawn, bluestems, and sedge. The vegetation in the ponds, swamps, and drainageways is chiefly cypress, sweetbay, blackgum, and water-tolerant grasses, such as maidencane.

Leon soils are poorly drained. Typically, the surface layer is very dark gray fine sand. The subsurface layer is grayish brown and light brownish gray fine sand. The subsoil is black, dark reddish brown, and grayish brown fine sand. The substratum to a depth of 80 inches or more is very pale brown fine sand.

Wesconnett soils are very poorly drained. Typically, the surface layer is black mucky fine sand. The subsoil to a depth of more than 80 inches is fine sand. The upper part is very dark brown, the next part is dark brown and brown, and the lower part is black. The sand grains in the upper and lower parts are coated with organic matter.

Sapelo soils are poorly drained. Typically, the surface layer is black fine sand. The subsurface layer is light brownish gray fine sand. The subsoil is dark brown and dark yellowish brown fine sand. The sand grains in the subsoil are coated with organic matter. Below the subsoil is a layer of light yellowish brown and pale brown fine sand. The substratum to a depth of 80 inches or more is gray and grayish brown sandy clay loam.

Minor in this map unit are Albany, Hurricane, Ortega, and Ridgewood soils on slight knolls.

Most of the acreage is used as woodland. Some small areas have been cleared and are used as pasture. In most areas this map unit is poorly suited to crops, well suited to pasture, and moderately well suited to pine trees. Wetness is the main limitation. The unit is poorly suited to urban development.

Soils on Stream Terraces and Flood Plains

These are somewhat poorly drained to very poorly drained, nearly level and gently sloping soils. Some are sandy throughout, and some are sandy to a depth of 20 to 80 inches and loamy in the lower part. Some have strata of sandy, loamy, and clayey material. The soils are mainly in the western and northern parts of the county.

10. Garcon-Elloree-Osier-Fluvaquents

Nearly level and gently sloping, somewhat poorly drained to very poorly drained soils that have a sandy surface layer and subsurface layer and a loamy subsoil, are sandy throughout, or have loamy and sandy strata

This map unit is on the long, narrow flood plain along the Suwannee River, on the western edge of the county. The unit makes up about 7,000 acres, or about 3 percent of the county. It is about 30 percent Garcon soils, 22 percent Elloree soils, 19 percent Osier soils, 11 percent Fluvaquents, and 18 percent soils of minor extent.

The natural vegetation is live oak, laurel oak, water oak, slash pine, longleaf pine, saw palmetto, pineland threeawn, and gallberry in the higher positions and baldcypress, sweetgum, sweetbay, red maple, and loblolly pine in the lower drainageways.

Garcon soils are somewhat poorly drained. Typically, the surface layer is very dark grayish brown fine sand. The subsurface layer is fine sand. The upper part is brown, and the lower part is pale brown. The upper part of the subsoil is pale brown fine sandy loam. The lower part is gray sandy clay loam. The substratum to a depth of 80 inches or more is light gray fine sand.

Elloree soils are poorly drained. Typically, the surface layer is very dark grayish brown loamy fine sand. The subsurface layer is light brownish gray and light gray loamy fine sand. The subsoil is gray and light gray sandy clay loam. The substratum to a depth of 80 inches or more is white sand.

Osier soils are poorly drained. Typically, the surface layer is very dark gray fine sand. The underlying material to a depth of 80 inches or more is fine sand. The upper part is gray, the next part is light gray, and the lower part is white.

Fluvaquents are poorly drained and very poorly drained. Typically, the surface layer is black mucky fine sand. The underlying strata extend to a depth of 80 inches or more. In sequence downward, these strata commonly are dark gray sandy clay loam, pale brown silt loam that has many fine and medium white shell fragments, very dark gray silt loam that has few white shell fragments, very pale brown sandy loam that has many fine and medium white shell fragments, light yellowish brown sandy loam that has pockets of white sand, and white sand that has many white shell fragments.

Minor in this map unit are Albany, Blanton, Ortega,

Penney, Resota, and Ridgewood soils at the higher elevations and Surrency soils in depressions.

Most of the acreage supports native vegetation. Some areas are used as woodland. A small acreage is used for urban development. In most areas this map unit is poorly suited to crops, pasture, and planted pine trees. Flooding and prolonged wetness are the main limitations affecting plant growth. The unit is poorly suited to urban development.

11. Fluvaquents-Elloree

Nearly level, poorly drained and very poorly drained soils that have loamy and sandy strata or are sandy throughout

This map unit is on the long, narrow flood plains along the Santa Fe River and along Cow Creek, on the northern edge of the county and on the northeastern edge of the Waccasassa Flats. The unit makes up about 2,000 acres, or about 1 percent of the county. It is about 55 percent Fluvaquents, 25 percent Elloree soils, and 20 percent soils of minor extent.

The landscape consists of flood plains and narrow or broad, elongated drainageways. The natural vegetation is baldcypress, sweetgum, sweetbay, red maple, and water oak.

Fluvaquents are poorly drained and very poorly drained. Typically, the surface layer is black mucky fine sand. The underlying strata extend to a depth of 80 inches or more. In sequence downward, these strata commonly are dark gray sandy clay loam, pale brown silt loam that has many fine and medium white shell fragments, very dark gray silt loam that has few white shell fragments, very pale brown sandy loam that has many fine and medium white shell fragments, light yellowish brown sandy loam that has pockets of white sand, and white sand that has many white shell fragments.

Elloree soils are poorly drained. Typically, the surface layer is very dark grayish brown loamy fine sand. The subsurface layer is light brownish gray and light gray loamy fine sand. The subsoil is gray and light gray sandy clay loam. The substratum to a depth of 80 inches or more is white sand.

Minor in this map unit are Albany, Meggett, Osier, and Ridgewood soils. Albany and Ridgewood soils are at the higher elevations.

Most of the acreage supports native vegetation. In most areas this map unit is poorly suited to crops, pasture, and planted pine trees. Flooding and prolonged wetness are the major limitations affecting plant growth. The unit is poorly suited to urban development.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Penney fine sand, 0 to 5 percent slopes, is a phase of the Penney series.

Some map units are made up of two or more major soils. These map units are called soil complexes or undifferentiated groups.

A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Elloree-Osier-Fluvaquents complex, frequently flooded, is an example.

An *undifferentiated group* is made up of two or more soils that could be mapped individually but are mapped as one unit because similar interpretations can be made for use and management. The pattern and proportion of the soils in the mapped areas are not uniform. An area can be made up of only one of the major soils, or it can be made up of all of them. Lynn Haven and Allanton mucky fine sands, depressional, is an undifferentiated group in this survey area.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The "Glossary" defines many of the terms used in describing the soils.

2—Penney fine sand, 0 to 5 percent slopes. This soil is nearly level and gently sloping and is excessively drained. It is on uplands. Individual areas are irregular in shape and range from about 15 to more than 500 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is dark grayish brown fine sand about 7 inches thick. The underlying material to a depth of about 80 inches is fine sand. The upper 10 inches is pale brown. The next 39 inches is very pale brown. The lower 24 inches is very pale brown and has thin layers of yellowish brown loamy fine sand.

On 80 percent of the acreage mapped as Penney fine sand, 0 to 5 percent slopes, Penney and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Albany, Otela, and Wadley soils.

Other included soils are similar to Penney fine sand but do not have lamellae. Individual areas of included soils are smaller than 5 acres.

Permeability is rapid in the Penney soil. The available water capacity is very low. Runoff is very slow. The water table is at a depth of more than 6 feet.

Most areas of this soil support natural vegetation, mainly turkey oak, bluejack oak, post oak, scrub live oak, blackjack oak, and longleaf pine. The understory is mainly a sparse cover of pineland threeawn, indiangrass, chalky bluestem, and panicum.

This soil has very severe limitations if it is used for cultivated crops. Because of the sandy texture, it does not retain sufficient moisture during dry periods. Plant nutrients are leached rapidly. Corn, peanuts, soybeans, tobacco, and watermelons can be grown but require intensive management measures and conservation practices, such as including cover crops in the crop rotation, returning crop residue to the soil, and applying fertilizer and lime. Irrigation is needed during droughty periods. Soil blowing is a severe hazard if the surface layer is exposed.

This soil is moderately well suited to tame pasture. Deep-rooted grasses, such as bahiagrass and improved bermudagrass, are suitable, but yields are generally reduced by periodic drought. Careful management is required to keep the pasture in good condition. This management includes establishment of a proper plant population, applications of fertilizer and lime, and controlled grazing. Irrigation can improve the quality of the pasture and of hay. It may be economical if irrigation water is available during extended dry periods. The soil is not suited to shallow-rooted pasture plants because it does not retain sufficient moisture in the root zone.

The potential productivity of this soil for pine trees is moderate. Slash pine, longleaf pine, and sand pine are suitable for planting. The sandy texture restricts the use of wheeled equipment unless the trees are harvested when the soil is moist. Because droughtiness can result in seedling mortality, the number of trees that are planted and the planting depth should be increased and the site should be mulched with the biomass that remains after harvesting. Plant competition can be controlled by site preparation activities, such as chopping with a drum chopper. A harvesting system that leaves most of the biomass on the surface is preferred.

The potential of this soil for openland and woodland wildlife habitat is poor, and the potential for wetland wildlife habitat is very poor. Water areas and a suitable source of food for wetland wildlife are not available.

The limitations affecting the use of this soil as a site for dwellings, small commercial buildings, and local roads and streets are slight. In areas that have a concentration of homes, the contamination of ground water is a hazard because of poor filtration in septic tank absorption fields.

This soil has severe limitations as a site for recreational uses. The loose, sandy surface layer severely limits trafficability in unpaved areas. Soil blowing is a hazard. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

This soil is in capability subclass IVs and is assigned the woodland ordination symbol 8S.

3—Penney fine sand, 5 to 8 percent slopes. This soil is moderately sloping and excessively drained. It is in small areas on sharp-breaking slopes and on relatively long slopes on broad uplands. Individual areas are irregular in shape and range from about 5 to more than 80 acres in size. Slopes are smooth or convex.

Typically, the surface layer is gray fine sand about 5 inches thick. The underlying material to a depth of 80 inches or more is fine sand. The upper 13 inches is light yellowish brown. The next 33 inches is very pale brown. The lower 29 inches is very pale brown and has thin layers of yellowish brown loamy fine sand.

On 80 percent of the acreage mapped as Penney fine sand, 5 to 8 percent slopes, Penney and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are small areas of Albany, Blanton, Ortega, and Wadley soils. Other included soils are similar to Penney fine sand but do not have lamellae. Individual areas of included soils are smaller than 5 acres.

Permeability is rapid in the Penney soil. The available water capacity is very low. Runoff is slow. The water table is below a depth of 6 feet.

Most areas of this soil support natural vegetation, mainly turkey oak, bluejack oak, post oak, scrub live oak, and longleaf pine. The understory is mainly a sparse cover of pineland threeawn, lopsided indiangrass, chalky bluestem, and panicum.

This soil has very severe limitations if it is used for cultivated crops because of droughtiness, the slope, and the hazard or erosion.

This soil is moderately well suited to tame pasture. Deep-rooted grasses, such as bahiagrass and improved bermudagrass, are suitable, but yields are generally reduced by periodic drought. Careful management is required to keep the pasture in good condition. This management includes establishment of a proper plant

population, applications of fertilizer and lime, and controlled grazing. Irrigation can improve the quality of the pasture and of hay. It may be economical if irrigation water is available during extended dry periods. The soil is not suited to shallow-rooted pasture plants because it does not retain sufficient moisture in the root zone.

The potential productivity of this soil for pine trees is moderate. Slash pine, longleaf pine, and sand pine are suitable for planting. The sandy texture restricts the use of wheeled equipment unless the trees are harvested when the soil is moist. Because droughtiness can result in seedling mortality, the number of trees that are planted and the planting depth should be increased and the site should be mulched with the biomass that remains after harvesting. Plant competition can be controlled by site preparation activities, such as chopping with a drum chopper. A harvesting system that leaves most of the biomass on the surface is preferred.

The potential of this soil for openland and woodland wildlife habitat is poor, and the potential for wetland wildlife habitat is very poor. Water areas and a suitable source of food for wetland wildlife are not available.

The limitations affecting the use of this soil as a site for dwellings and local roads and streets are slight. In areas that have a concentration of homes, the contamination of ground water is a hazard because of poor filtration in septic tank absorption fields. The slope is a limitation on sites for small commercial buildings.

This soil has severe limitations as a site for recreational uses. The loose, sandy surface layer severely limits trafficability in unpaved areas. Soil blowing is a hazard. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed. The slope is a limitation affecting some uses.

This soil is in capability subclass VIs and is assigned the woodland ordination symbol 8S.

4—Otela-Penney fine sands, 0 to 5 percent slopes. These nearly level and gently sloping soils are on uplands. The Otela soil is moderately well drained, and the Penney soil is excessively drained. Individual areas are irregular in shape and range from 15 to more than 500 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer of the Otela soil is dark grayish brown fine sand about 8 inches thick. The subsurface layer extends to a depth of about 60 inches. It is fine sand. The upper 24 inches is light yellowish brown, and the lower 36 inches is very pale brown. The subsoil to a depth of about 80 inches is sandy clay loam. The upper 11 inches is light yellowish brown, and the lower 9 inches is light gray and has a few fine limestone pebbles.

Typically, the surface layer of the Penney soil is dark grayish brown fine sand about 5 inches thick. The underlying material to a depth of about 80 inches is fine sand. The upper 10 inches is pale brown. The next 31 inches is very pale brown. The lower 34 inches is very pale brown and has thin layers of yellowish brown loamy fine sand.

On 95 percent of the acreage mapped as Otela-Penney fine sands, 0 to 5 percent slopes, Otela, Penney, and similar soils make up 80 to 100 percent of the mapped areas. Generally, the mapped areas are about 55 percent Otela and similar soils and 43 percent Penney and similar soils. The components of this map unit occur as areas so intricately intermingled that mapping them separately is not practical. The proportions and patterns of the Otela, Penney, and similar soils, however, are relatively consistent in most of the mapped areas. Dissimilar soils make up about 0 to 20 percent of the areas. On 0 to 20 percent of the acreage, the dissimilar soils make up more than 20 percent of the areas.

The dissimilar soils included in this map unit are small areas of Blanton, Shadeville, and Wadley soils and soils that consist of sandy material over bedrock. Individual areas of included soils are smaller than 5 acres.

Permeability is slow or moderately slow in the Otela soil and rapid in the Penney soil. The available water capacity is low in the Otela soil and very low in the Penney soil. Runoff is slow on both soils. The seasonal high water table is at a depth of 48 to 72 inches for 1 to 5 months during most years in the Otela soil and is below a depth of 72 inches in the Penney soil.

Some areas of these soils support natural vegetation, mainly laurel oak, live oak, turkey oak, slash pine, loblolly pine, longleaf pine, and scattered palmettoes. The understory is mainly a sparse cover of pineland threeawn, indiangrass, chalky bluestem, and panicum.

These soils have severe limitations if they are used for cultivated crops. Because of the sandy texture, they do not retain sufficient moisture during dry periods. Plant nutrients are leached rapidly. Corn, peanuts, soybeans, tobacco, and watermelons can be grown but require intensive management measures and conservation practices, such as including cover crops in the crop rotation, returning crop residue to the soils, and applying fertilizer and lime. Irrigation is needed during droughty periods. Soil blowing is a severe hazard if the surface layer is exposed.

These soils are moderately well suited to tame pasture. Deep-rooted grasses, such as bahiagrass and

improved bermudagrass, are suitable, but yields are generally reduced by periodic drought. Careful management is required to keep the pasture in good condition. This management includes establishment of a proper plant population, applications of fertilizer and lime, and controlled grazing. Irrigation can improve the quality of the pasture and of hay. It may be economical if irrigation water is available during extended dry periods. These soils are not suited to shallow-rooted pasture plants because they do not retain sufficient moisture in the root zone.

The potential productivity of these soils for pine trees is moderately high. Slash pine, loblolly pine, longleaf pine, and sand pine are suitable for planting. The sandy texture restricts the use of wheeled equipment unless the trees are harvested when the soils are moist. Because droughtiness can result in seedling mortality, the number of trees that are planted and the planting depth should be increased and the site should be mulched with the biomass that remains after harvesting. Plant competition can be controlled by site preparation activities, such as chopping with a drum chopper. A harvesting system that leaves most of the biomass on the surface is preferred.

The potential of these soils for openland and woodland wildlife habitat is fair or poor, and the potential for wetland wildlife habitat is very poor. Water areas and a suitable source of food for wetland wildlife are not available.

The limitations affecting the use of these soils as sites for dwellings without basements, for small commercial buildings, and for local roads and streets are slight. In areas that have a concentration of homes, the contamination of ground water is a hazard because of poor filtration in septic tank absorption fields.

These soils have severe limitations as sites for recreational uses. The loose, sandy surface layer severely limits trafficability in unpaved areas. Soil blowing is a hazard. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

The Otela soil is in capability subclass IIIs and is assigned the woodland ordination symbol 10S. The Penney soil is in capability subclass IVs and is assigned the woodland ordination symbol 8S.

5—Resota fine sand, 0 to 5 percent slopes, occasionally flooded. This soil is nearly level and gently sloping and is moderately well drained. It is in the higher areas on flood plains. Individual areas are irregularly shaped or elongated and range from about 5 to more than 150 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is dark gray fine sand about 5 inches thick. The subsurface layer is light gray fine sand. It extends to a depth of about 12 inches. The subsoil is fine sand. It extends to a depth of about 55 inches. The upper 4 inches is brown and dark yellowish brown, the next 10 inches is brownish yellow, and the lower 29 inches is yellow. The substratum to a depth of about 80 inches is very pale brown fine sand.

On 80 percent of the acreage mapped as Resota fine sand, 0 to 5 percent slopes, occasionally flooded, Resota and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Albany, Garcon, and Wadley soils. Other included soils are similar to Resota fine sand but do not have a spodic horizon. Individual areas of included soils are smaller than 5 acres.

Permeability is very rapid in the Resota soil. The available water capacity is very low. Runoff is very slow. The water table is at a depth of 48 to 60 inches for 6 months or more in most years. It is at a depth of 60 inches or more during dry periods.

Most areas of this soil support natural vegetation, mainly slash pine, sand pine, longleaf pine, sand live oak, and turkey oak. The understory is chiefly palmettoes, shrubs, rosemary, bluestems, and pineland threeawn.

This soil has very severe limitations if it is used for cultivated crops. Because of the sandy texture, it does not retain sufficient moisture during dry periods. Plant nutrients are leached rapidly.

This soil is poorly suited to tame pasture. Deep-rooted grasses, such as bahiagrass and improved bermudagrass, are suitable, but yields are generally reduced by periodic drought and the occasional flooding. Careful management is required to keep the pasture in good condition. This management includes establishment of a proper plant population, applications of fertilizer and lime, and controlled grazing. Irrigation can improve the quality of the pasture and of hay. It may be economical if irrigation water is available during extended dry periods. The soil is not suited to shallow-rooted pasture plants because it does not retain sufficient moisture in the root zone.

The potential productivity of this soil for pine trees is moderate. Slash pine and longleaf pine are suitable for planting. The sandy texture restricts the use of wheeled equipment unless the trees are harvested when the soil is moist. Because droughtiness can result in seedling mortality, the number of trees that are planted and the planting depth should be increased and the site should be mulched with the biomass that remains after

harvesting. Plant competition can be controlled by site preparation activities, such as chopping with a drum chopper. A harvesting system that leaves most of the biomass on the surface is preferred.

The potential of this soil for openland and woodland wildlife habitat is poor, and the potential for wetland wildlife habitat is very poor. Water areas and a suitable source of food for wetland wildlife are not available.

This soil is severely limited as a site for dwellings, small commercial buildings, local roads and streets, and septic tank absorption fields because of the occasional flooding.

This soil has severe limitations as a site for recreational uses. The loose, sandy surface layer severely limits trafficability in unpaved areas. Soil blowing is a hazard. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed. Flooding is a hazard in camp areas.

This soil is in capability subclass VIs and is assigned the woodland ordination symbol 8S.

6—Ridgewood fine sand, 0 to 5 percent slopes. This soil is nearly level and gently sloping and is somewhat poorly drained. It is in the broad flatwoods and along transitional areas in the uplands. Individual areas are irregular in shape and range from about 10 to more than 200 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is dark gray fine sand about 6 inches thick. The underlying material to a depth of 80 inches or more is fine sand. The upper 19 inches is light yellowish brown, the next 15 inches is pale brown and light brownish gray, and the lower 40 inches is light gray.

On 80 percent of the acreage mapped as Ridgewood fine sand, 0 to 5 percent slopes, Ridgewood and similar soils make up 80 to 90 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Albany and Hurricane soils. Other included soils are similar to Ridgewood fine sand but have a spodic horizon or lamellae. Individual areas of included soils are smaller than 5 acres.

Permeability is rapid in the Ridgewood soil. The available water capacity is low. Runoff is very slow. The water table is at a depth of 24 to 42 inches for 2 to 6 months during most years. During extremely wet periods it rises to a depth of 15 to 24 inches for less than 3 weeks. During dry periods it is at a depth of more than 40 inches.

Most areas of this soil support natural vegetation, mainly water oak, laurel oak, live oak, slash pine, and longleaf pine. The understory is mainly a sparse cover of waxmyrtle, sumac, blackberry, gallberry, saw palmetto, broomsedge bluestem, pineland threeawn, and other native weeds and grasses.

This soil has severe limitations if it is used for cultivated crops. The high water table can retard root growth during wet periods. Because of the sandy texture, plant nutrients are leached rapidly. Corn, soybeans, peanuts, and watermelons can be grown but require intensive management measures and conservation practices, such as including cover crops in the crop rotation, returning crop residue to the soil, and applying fertilizer and lime. A good water-control system is needed to remove excess water during wet periods and provide irrigation water during droughty periods.

This soil is moderately well suited to tame pasture. Improved bermudagrass, bahiagrass, and clover are suitable, but yields are generally reduced by periodic wetness. Careful management is required to keep the pasture in good condition. This management includes establishment of a proper plant population, applications of fertilizer and lime, and controlled grazing. A water-control system is needed to remove excess surface water during periods of heavy rainfall and provide irrigation water during droughty periods.

The potential productivity of this soil for pine trees is moderately high. Slash pine and longleaf pine are suitable for planting. Proper site preparation activities, such as harrowing and bedding, help to establish seedlings, reduce the seedling mortality rate, and increase the early growth rate. Chopping and bedding remove debris, control competing vegetation, and facilitate planting. Logging with machinery equipped with large tires or tracks facilitates the use of equipment and minimizes compaction and root damage during thinning activities. Logging systems that leave the residual biomass well distributed throughout the site increase the organic matter content and improve the fertility of the soil. The trees respond well to applications of fertilizer.

The potential of this soil for woodland wildlife habitat is fair, and the potential for openland and wetland wildlife habitat is poor. Water areas and a suitable source of food for wetland wildlife are not available.

The limitations affecting the use of this soil as a site for dwellings without basements, small commercial buildings, and local roads and streets are moderate, and those affecting septic tank absorption fields are severe. Wetness, poor filtration, and the sandy texture are the major limitations. A deep drainage system is needed. Mounding may be needed on sites for septic tank absorption fields. If the density of housing is

moderate or high, community sewage systems may be needed to prevent the contamination of ground water by seepage.

This soil has severe limitations as a site for recreational uses. The loose, sandy surface layer severely limits trafficability. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

This soil is in capability subclass IVs and is assigned the woodland ordination symbol 10W.

7—Leon fine sand. This soil is nearly level and poorly drained. It is in the broad flatwoods. Individual areas are irregularly shaped or elongated and generally range from 10 to more than 100 acres in size. Slopes are smooth or concave and are 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 6 inches thick. The subsurface layer is fine sand about 15 inches thick. The upper 9 inches is grayish brown, and the lower 6 inches is light brownish gray. The subsoil is fine sand that is coated with organic matter. It extends to a depth of about 60 inches. It is black in the upper 7 inches, dark reddish brown in the next 12 inches, and grayish brown in the lower 20 inches. The substratum to a depth of about 80 inches is very pale brown fine sand.

On 80 percent of the acreage mapped as Leon fine sand, Leon and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Sapelo and soils that have an organic surface layer. Other included soils are similar to Leon fine sand but are deeper to a spodic layer. Individual areas of included soils are smaller than 5 acres.

Permeability is rapid in the Leon soil. The available water capacity is low. Runoff is slow. The seasonal high water table is at a depth of 6 to 18 inches for 1 to 6 months during most years.

Most areas support natural vegetation, mainly longleaf pine and slash pine and an understory of saw palmetto, running oak, gallberry, waxmyrtle, huckleberry, pineland threeawn, bluestems, briers, and brackenfern.

Wetness and low natural fertility are very severe limitations if this soil is used for cultivated crops. The number of suitable crops is limited unless intensive management is applied. If a good water-control system is installed and soil-improving measures are applied, however, the soil is suited to many crops. A water-control system is needed to remove excess surface water during wet periods and to provide water for subsurface irrigation during droughty periods. Row crops should be grown in rotation with close-growing, soil-improving cover crops. The cover crops and the residue from other crops should be used to maintain the content of organic matter and to control erosion. Seedbed preparation should include bedding of the rows. Fertilizer and lime should be applied according to the needs of the crops.

This soil is well suited to tame pasture. Improved bermudagrass, bahiagrass, and clover grow well if the pasture is well managed. A water-control system is needed to remove excess surface water during periods of heavy rainfall. Regular applications of fertilizer are needed to increase yields. Controlled grazing helps to maintain plant vigor.

The potential productivity of this soil for pine trees is high. Slash pine is suitable for planting. Timely site preparation activities, such as harrowing and bedding, help to establish seedlings, reduce the seedling mortality rate, and increase the early growth rate. Chopping and bedding remove debris, control competing vegetation, and facilitate planting. Logging with machinery equipped with large tires or tracks facilitates the use of equipment and minimizes compaction and root damage during thinning activities. Logging systems that leave the residual biomass well distributed throughout the site can help to maintain the content of organic matter and improve the fertility of the soil. The trees respond well to applications of fertilizer.

The potential of this soil for openland and woodland wildlife habitat is fair, and the potential for wetland wildlife habitat is poor. Water areas and a suitable source of food for wetland wildlife are not available.

The limitations affecting the use of this soil as a site for dwellings without basements and for small commercial buildings, local roads and streets, and septic tank absorption fields are severe. The seasonal high water table and poor filtration are the main limitations. A deep drainage system is needed. Mounding may be needed on sites for septic tank absorption fields. If the density of housing is moderate or high, community sewage systems may be needed to prevent the contamination of ground water by seepage.

This soil has severe limitations as a site for recreational uses. The seasonal high water table and the loose, sandy surface layer severely limit trafficability. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

This soil is in capability subclass IVw and is assigned the woodland ordination symbol 11W.

8—Lynn Haven and Allanton mucky fine sands, depressional. These soils are nearly level and very poorly drained. They are in depressions in the flatwoods. Individual areas are irregular in shape and range from about 5 to 300 acres in size.

Typically, the surface layer of the Lynn Haven soil is about 18 inches thick. The upper 10 inches is black mucky fine sand, and the lower 8 inches is very dark gray fine sand. The subsurface layer is grayish brown fine sand. It extends to a depth of about 25 inches. The subsoil to a depth of about 80 inches is fine sand. The upper 21 inches is black, the next 5 inches is dark brown, and the lower 29 inches is black.

Typically, the surface layer of the Allanton soil is about 18 inches thick. The upper 10 inches is very dark gray mucky fine sand, and the lower 8 inches is very dark grayish brown fine sand. The subsurface layer is fine sand. It extends to a depth of about 52 inches. The upper 6 inches is dark gray, and the lower 28 inches is grayish brown. The subsoil extends to a depth of 80 inches or more. The upper 10 inches is very dark grayish brown, and the lower part is very dark gray. The sand grains are well coated with organic matter.

On 95 percent of the acreage mapped as Lynn Haven and Allanton mucky fine sands, depressional, Lynn Haven, Allanton, and similar soils make up 80 to 100 percent of the mapped areas. Generally, the mapped areas are about 55 percent Lynn Haven and similar soils and 43 percent Allanton and similar soils. The components of this map unit occur as areas so intricately intermingled that mapping them separately is not practical. The proportions and patterns of the Lynn Haven, Allanton, and similar soils, however, are relatively consistent in most of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are small areas of Pamlico and Surrency soils. Individual areas of included soils are smaller than 5 acres.

Permeability is moderate or moderately rapid in the Lynn Haven and Allanton soils. Internal drainage is slow, however, because it is impeded by a high water table. The water table is above the surface during wet periods. It recedes to a depth of more than 40 inches during very dry periods. The available water capacity is low.

Most areas support natural vegetation, mainly pondcypress, baldcypress, blackgum, sweetbay, red maple, and swamp tupelo. A few areas support water-tolerant grasses. Unless major water-control systems are installed, these soils are unsuited to cultivated crops, tame grasses, and planted pine trees because of ponding and prolonged wetness.

The potential of these soils for openland and woodland wildlife habitat is very poor. The ponded areas do not provide desirable habitat for these kinds of wildlife, and attempts to improve the openland or woodland habitat would be unsatisfactory. The potential for wetland wildlife habitat is good.

The limitations affecting the development of these soils for recreational and urban uses, including septic tank absorption fields, dwellings, small commercial buildings, and local roads and streets, are severe. Ponding and wetness are the major limitations. Overcoming these limitations is difficult without major drainage systems and additions of fill material. The high water table can prevent adequate filtration of the effluent in septic tank absorption fields. Inadequate filtration can result in the contamination of ground water.

These soils are in capability subclass VIIw and are assigned the woodland ordination symbol 2W.

9—Hurricane fine sand, 0 to 5 percent slopes. This soil is nearly level and gently sloping and is somewhat poorly drained. It is on slight rises in the flatwoods. Individual areas are irregular in shape and range from about 15 to more than 80 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is dark grayish brown fine sand about 6 inches thick. The subsurface layer extends to a depth of about 72 inches. The upper 59 inches is light yellowish brown, pale brown, and light gray fine sand, and the lower 7 inches is pinkish gray sand. The subsoil to a depth of about 80 inches is dark reddish brown fine sand.

On 80 percent of the acreage mapped as Hurricane fine sand, 0 to 5 percent slopes, Hurricane and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Albany, Blanton, Leon, Mandarin, and Ortega soils. Other included soils are similar to Hurricane fine sand but have a water table below a depth of 42 inches. Individual areas of included soils are smaller than 5 acres.

Permeability is moderately rapid in the Hurricane soil. The available water capacity is low. The seasonal high water table is at a depth of 24 to 42 inches for 3 to 6 months during most years.

Most areas of this soil are forested with planted slash

pine and longleaf pine and with a natural vegetation of water oak, bluejack oak, post oak, and live oak. The understory is waxmyrtle, sumac, gallberry, saw palmetto, pineland threeawn, bluestems, carpetgrass, and panicum.

This soil has severe limitations if it is used for cultivated crops. The high water table can retard root growth during wet periods. Because of the sandy texture, plant nutrients are leached rapidly. Corn, soybeans, peanuts, and watermelons can be grown but require intensive management measures and conservation practices, such as including cover crops in the crop rotation, returning crop residue to the soil, and applying fertilizer and lime. A good water-control system is needed to remove excess water during wet periods and provide irrigation water during droughty periods.

This soil is moderately well suited to tame pasture. Improved bermudagrass, bahiagrass, and clover are suitable, but yields are generally reduced by periodic wetness. Careful management is required to keep the pasture in good condition. This management includes establishment of a proper plant population, applications of fertilizer and lime, and controlled grazing. A water-control system is needed to remove excess surface water during periods of heavy rainfall and provide irrigation water during droughty periods.

The potential productivity of this soil for pine trees is high. Slash pine and longleaf pine are suitable for planting. Proper site preparation activities, such as harrowing and bedding, help to establish seedlings, reduce the seedling mortality rate, and increase the early growth rate. Chopping and bedding remove debris, control competing vegetation, and facilitate planting. Logging with machinery equipped with large tires or tracks facilitates the use of equipment and minimizes compaction and root damage during thinning activities. Logging systems that leave the residual biomass well distributed throughout the site increase the organic matter content and improve the fertility of the soil. The trees respond well to applications of fertilizer.

The potential of this soil for openland wildlife habitat is poor, the potential for woodland wildlife habitat is fair, and the potential for wetland wildlife habitat is very poor.

The limitations affecting the use of this soil as a site for dwellings without basements, small commercial buildings, and local roads and streets are moderate, and those affecting septic tank absorption fields are severe. Wetness and poor filtration are the major limitations. A deep drainage system is needed. Mounding may be needed on sites for septic tank absorption fields. If the density of housing is moderate or high, community sewage systems may be needed to prevent the contamination of ground water by seepage.

This soil is in capability subclass IIIw and is assigned the woodland ordination symbol 11W.

10—Garcon fine sand, 0 to 5 percent slopes, occasionally flooded. This soil is nearly level and gently sloping and is somewhat poorly drained. It is in the higher positions on flood plains. Individual areas are irregular in shape and range from 10 to more than 250 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is very dark grayish brown fine sand about 7 inches thick. The subsurface layer is fine sand. It extends to a depth of about 29 inches. The upper 10 inches is brown, and the lower 12 inches is pale brown. The subsoil extends to a depth of about 58 inches. The upper 11 inches is pale brown sandy loam, and the lower 18 inches is gray sandy clay loam. The substratum to a depth of 80 inches is light gray fine sand.

On 80 percent of the acreage mapped as Garcon fine sand, 0 to 5 percent slopes, occasionally flooded, Garcon and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Osier and Penney soils and soils that are underlain by soft limestone bedrock. Other included soils are similar to Garcon fine sand but have a surface layer and subsurface layer that, combined, are less than 20 inches thick. Individual areas of included soils are smaller than 5 acres.

Permeability is moderate in the Garcon soil. The available water capacity also is moderate. Runoff is slow. The water table is at a depth of 18 to 36 inches for 1 to 6 months during most years.

Most areas of this soil support natural vegetation, mainly live oak, laurel oak, water oak, slash pine, longleaf pine, and sweetgum and an understory of pineland threeawn, gallberry, saw palmetto, and grassleaf goldaster.

This soil has severe limitations if it is used for cultivated crops. The major management concerns are flooding and wetness. Under natural conditions, the best suited crops are those that are tolerant of slightly wet conditions. Irrigation may be needed. It is feasible in areas of some high-value crops during prolonged droughty periods. The crop rotations should include close-growing crops at least half of the time. Soil-improving cover crops and all crop residue should be left on the soil. The best yields require good seedbed preparation and applications of fertilizer and lime.

This soil is well suited to tame pasture. Such grasses

as improved bermudagrass and improved bahiagrass produce high-quality forage if the pasture is well managed. The best yields require applications of fertilizer and lime and controlled grazing. Shallow-rooted pasture plants generally do not grow well. Unless the pasture is irrigated, they cannot produce high-quality forage during dry periods, when the soil is droughty.

The potential productivity of this soil for pine trees is moderately high. Slash pine is suitable for planting. Proper site preparation activities, such as harrowing and bedding, help to establish seedlings, reduce the seedling mortality rate, and increase the early growth rate. Chopping and bedding remove debris, control competing vegetation, and facilitate planting. Logging with machinery equipped with large tires or tracks facilitates the use of equipment and minimizes compaction and root damage during thinning activities. Logging systems that leave the residual biomass well distributed throughout the site increase the organic matter content and improve the fertility of the soil. The trees respond well to applications of fertilizer.

The potential of this soil for openland and woodland wildlife habitat is fair, and the potential for wetland wildlife habitat is poor.

The limitations affecting the use of this soil as a site for dwellings, small commercial buildings, local roads and streets, and septic tank absorption fields are severe. These limitations are flooding, wetness, and seepage. They can be overcome by flood control and a drainage system that lowers the seasonal high water table. Mounding may be needed on sites for septic tank absorption fields.

This soil has severe limitations as a site for recreational uses. The flooding, the wetness, and the loose, sandy surface layer are the major problems affecting trafficability. The flooding and the wetness can be overcome by a good flood- and water-control system. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

This soil is in capability subclass IIIw and is assigned the woodland ordination symbol 10W.

11—Ortega fine sand, 0 to 5 percent slopes. This soil is nearly level and gently sloping and is moderately well drained. It is on slight knolls in the flatwoods and on ridges in the uplands. Individual areas are irregular in shape and generally range from 10 to more than 65 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is very dark grayish brown fine sand about 6 inches thick. The underlying material to a depth of about 80 inches is fine sand. The upper part is brown and pale brown, and the part below a depth of 60 inches is light gray.

On 80 percent of the acreage mapped as Ortega fine sand, 0 to 5 percent slopes, Ortega and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Albany and Blanton soils and soils that are underlain by spodic material. Other included soils are similar to Ortega fine sand but have a water table closer to the surface. Individual areas of included soils are smaller than 5 acres.

Permeability is rapid in the Ortega soil. The available water capacity is low. The water table is at a depth of 48 to 60 inches for 1 to 5 months during most years. It is at a depth of more than 60 inches during droughty periods.

Most areas of this soil support natural vegetation, mainly live oak, laurel oak, post oak, turkey oak, water oak, laurelcherry, slash pine, loblolly pine, and longleaf pine. The understory is mainly lopsided indiangrass, hairy panicum, low panicum, greenbrier, hawthorn, persimmon, fringeleaf paspalum, hairy tickclover, dwarf huckleberry, chalky bluestem, creeping bluestem, and pineland threeawn.

This soil has severe limitations if it is used for cultivated crops. Because of the sandy texture, it does not retain sufficient moisture during dry periods. Plant nutrients are leached rapidly. Corn, peanuts, soybeans, tobacco, and watermelons can be grown but require intensive management measures and conservation practices, such as including cover crops in the crop rotation, returning crop residue to the soil, and applying fertilizer and lime. Irrigation is needed during droughty periods. Soil blowing is a severe hazard if the surface layer is exposed.

This soil is well suited to improved pasture. Deep-rooted grasses, such as bahiagrass and improved bermudagrass, are suitable, but yields are generally reduced by periodic drought. Careful management is required to keep the pasture in good condition. This management includes establishment of a proper plant population, applications of fertilizer and lime, and controlled grazing. Irrigation can improve the quality of the pasture and of hay. It may be economical if irrigation water is available during extended dry periods. The soil is not suited to shallow-rooted pasture plants because it does not retain sufficient moisture in the root zone.

The potential productivity of this soil for pine trees is moderately high. Slash pine and longleaf pine are suitable for planting. The sandy texture restricts the use of wheeled equipment unless the trees are harvested

when the soil is moist. Because droughtiness can result in seedling mortality, the number of trees that are planted and the planting depth should be increased and the site should be mulched with the biomass that remains after harvesting. Plant competition can be controlled by site preparation activities, such as chopping with a drum chopper. A harvesting system that leaves most of the biomass on the surface is preferred.

The potential of this soil for openland and woodland wildlife habitat is fair, and the potential for wetland wildlife habitat is very poor.

The limitations affecting the use of this soil as a site for dwellings without basements, small commercial buildings, and local roads and streets are slight. The water table is a moderate limitation on sites for septic tank absorption fields. During wet periods it can hinder the downward movement of effluent and can become contaminated. In areas that have a concentration of homes, the contamination of ground water is a hazard because of poor filtration in the absorption fields.

This soil has severe limitations as a site for recreational uses. The loose, sandy surface layer severely limits trafficability. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

This soil is in capability subclass IIIs and is assigned the woodland ordination symbol 10S.

12—Albany fine sand, 0 to 5 percent slopes. This soil is nearly level and gently sloping and is somewhat poorly drained. It is on the lower parts of broad, low ridges and on slight knolls in the flatwoods. Individual areas are irregularly shaped or elongated and range from about 25 to more than 200 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is very dark gray fine sand about 7 inches thick. The subsurface layer is fine sand. It extends to a depth of about 41 inches. The upper 17 inches is pale brown, and the lower 17 inches is very pale brown. The subsoil to a depth of 80 inches or more is fine sandy loam. It is light gray in the upper part and mottled yellowish brown, pale brown, and light gray in the lower part.

On 80 percent of the acreage mapped as Albany fine sand, 0 to 5 percent slopes, Albany and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Blanton, Hurricane, and Ridgewood soils. Individual areas of included soils are smaller than 5 acres.

Permeability is moderate in the Albany soil. The available water capacity is low. The water table is at a depth of 12 to 30 inches for 1 to 6 months during most years.

Most areas of this soil support natural vegetation, mainly slash pine, loblolly pine, longleaf pine, water oak, live oak, laurel oak, and sweetgum. The understory is chiefly waxmyrtle, greenbrier, devils walkingstick, bluestems, panicum, pineland threeawn, toothachegrass, inkberry, and switchgrass.

This soil has severe limitations if it is used for cultivated crops. Because of the sandy texture, it does not retain sufficient moisture during dry periods. Plant nutrients are leached rapidly. The water table can restrict root development during wet periods. Corn, peanuts, soybeans, tobacco, and watermelons can be grown but require intensive management measures and conservation practices, such as including cover crops in the crop rotation, returning crop residue to the soil, and applying fertilizer and lime. Irrigation is needed during droughty periods. Soil blowing is a severe hazard if the surface layer is exposed.

This soil is well suited to tame pasture. Deep-rooted grasses, such as bahiagrass and improved bermudagrass, are suitable, but yields are generally reduced by periodic drought and seasonal wetness. Careful management is required to keep the pasture in good condition. This management includes establishment of a proper plant population, applications of fertilizer and lime, and controlled grazing. Irrigation can improve the quality of the pasture and of hay. It may be economical if irrigation water is available during extended dry periods. The soil is not suited to shallow-rooted pasture plants because it does not retain sufficient moisture in the root zone.

The potential productivity of this soil for pine trees is high. Loblolly pine, slash pine, and longleaf pine are suitable for planting. Proper site preparation activities, such as harrowing and bedding, help to establish seedlings, reduce the seedling mortality rate, and increase the early growth rate. Chopping and bedding remove debris, control competing vegetation, and facilitate planting. Logging with machinery equipped with large tires or tracks facilitates the use of equipment and minimizes compaction and root damage during thinning activities. Logging systems that leave the residual biomass well distributed throughout the site increase the organic matter content and improve the fertility of the soil. The trees respond well to applications of fertilizer.

The potential of this soil for openland and woodland

wildlife habitat is fair, and the potential for wetland wildlife habitat is poor. Water areas and a suitable source of food for wetland wildlife are not available.

The limitations affecting the use of this soil as a site for dwellings without basements and for small commercial buildings, local roads and streets, and septic tank absorption fields are severe. Wetness is the major limitation. A good drainage system is needed. It should be able to remove excess water rapidly and should control the water table.

This soil has severe limitations as a site for recreational uses. The loose, sandy surface layer severely limits trafficability. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

This soil is in capability subclass IIIe and is assigned the woodland ordination symbol 11W.

13—Wadley fine sand, 0 to 5 percent slopes. This soil is nearly level and gently sloping and is well drained. It is on uplands. Individual areas are irregular in shape and range from about 5 to more than 60 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is dark grayish brown fine sand about 8 inches thick. The subsurface layer is fine sand. It extends to a depth of about 43 inches. The upper 11 inches is pale brown, the next 16 inches is brownish yellow, and the lower 8 inches is very pale brown. The subsoil extends to a depth of about 80 inches. The upper 29 inches is strong brown sandy clay loam, and the lower 8 inches is light yellowish brown sandy loam.

On 80 percent of the acreage mapped as Wadley fine sand, 0 to 5 percent slopes, Wadley and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Albany, Blanton, and Penney soils and soils that are underlined by soft limestone bedrock. Individual areas of included soils are smaller than 5 acres.

Permeability is moderate in the Wadley soil. The available water capacity is low. Runoff is slow. The water table is below a depth of 6 feet.

Most areas of this soil support natural vegetation, mainly live oak, laurel oak, post oak, laurelcherry, and scattered pine. The understory is mainly a sparse cover of pineland threeawn, indiangrass, chalky bluestem, greenbrier, and panicum.

This soil has severe limitations if it is used for cultivated crops. Because of the sandy texture, it does not retain sufficient moisture during dry periods. Plant nutrients are leached rapidly. Corn, peanuts, soybeans, tobacco, and watermelons can be grown but require intensive management measures and conservation practices, such as including cover crops in the crop rotation, returning crop residue to the soil, and applying fertilizer and lime. Irrigation is needed during droughty periods. Soil blowing is a severe hazard if the surface layer is exposed.

This soil is moderately well suited to tame pasture. Deep-rooted grasses, such as bahiagrass and improved bermudagrass, are suitable, but yields are generally reduced by periodic drought. Careful management is required to keep the pasture in good condition. This management includes establishment of a proper plant population, applications of fertilizer and lime, and controlled grazing. Irrigation can improve the quality of the pasture and of hay. It may be economical if irrigation water is available during extended dry periods. The soil is not suited to shallow-rooted pasture plants because it does not retain sufficient moisture in the root zone.

The potential productivity of this soil for pine trees is high. Slash pine, longleaf pine, and loblolly pine are suitable for planting. The sandy texture restricts the use of wheeled equipment unless the trees are harvested when the soil is moist. Because droughtiness can result in seedling mortality, the number of trees that are planted and the planting depth should be increased and the site should be mulched with the biomass that remains after harvesting. Plant competition can be controlled by site preparation activities, such as chopping with a drum chopper. A harvesting system that leaves most of the biomass on the surface is preferred.

The potential of this soil for openland wildlife habitat is fair, the potential for woodland wildlife habitat is poor, and the potential for wetland wildlife habitat is very poor. Water areas and a suitable source of food for wetland wildlife are not available.

The limitations affecting the use of this soil as a site for dwellings, small commercial buildings, local roads and streets, and septic tank absorption fields are slight.

This soil has severe limitations as a site for recreational uses. The loose, sandy surface layer severely limits trafficability in unpaved areas. Soil blowing is a hazard. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

This soil is in capability subclass IIIs and is assigned the woodland ordination symbol 11S.

14—Pottsburg fine sand. This soil is nearly level and poorly drained. It is in narrow areas between depressions in the flatwoods. Individual areas are irregularly shaped or elongated and range from about 5 to more than 50 acres in size. Slopes are smooth or concave and are 0 to 2 percent.

Typically, the surface layer is very dark gray fine sand about 5 inches thick. The subsurface layer is fine sand. It extends to a depth of about 63 inches. The upper 23 inches is gray, and the lower 35 inches is grayish brown. The subsoil to a depth of 80 inches or more is fine sand that is coated with organic matter. It is very dark gray to a depth of 67 inches and black below that depth.

On 80 percent of the acreage mapped as Pottsburg fine sand, Pottsburg and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Allanton, Lynn Haven, and Sapelo soils. Individual areas of included soils are smaller than 5 acres.

Permeability is moderate in the Pottsburg soil. The available water capacity is low. Runoff is slow. The seasonal high water table is at a depth of 6 to 18 inches for 1 to 6 months during most years.

Most areas support natural vegetation, mainly longleaf pine and slash pine and an understory of saw palmetto, running oak, gallberry, waxmyrtle, huckleberry, pineland threeawn, bluestems, briers, and brackenfern.

Wetness and low natural fertility are very severe limitations if this soil is used for cultivated crops. The number of suitable crops is limited unless intensive management is applied. If a good water-control system is installed and soil-improving measures are applied, however, the soil is suited to many crops. A water-control system is needed to remove surface excess water during wet periods and to provide water for subsurface irrigation during droughty periods. Row crops should be grown in rotation with close-growing, soil-improving cover crops. The cover crops and the residue from other crops should be used to maintain the content of organic matter and to control erosion. Seedbed preparation should include bedding of the rows. Fertilizer and lime should be applied according to the needs of the crops and the expected level of yields.

This soil is well suited to tame pasture. Improved bermudagrass, bahiagrass, and clover grow well if the pasture is well managed. A water-control system is needed to remove excess surface water during periods of heavy rainfall. Regular applications of fertilizer are needed to increase yields. Controlled grazing helps to maintain plant vigor.

The potential productivity of this soil for pine trees is moderate. Slash pine and longleaf pine are suitable for planting. Timely site preparation activities, such as harrowing and bedding, help to establish seedlings, reduce the seedling mortality rate, and increase the early growth rate. Chopping and bedding remove debris, control competing vegetation, and facilitate planting. Logging with machinery equipped with large tires or tracks facilitates the use of equipment and minimizes compaction and root damage during thinning activities. Logging systems that leave the residual biomass well distributed throughout the site can help to maintain the content of organic matter and improve the fertility of the soil. The trees respond well to applications of fertilizer.

The potential of this soil for openland, woodland, and wetland wildlife habitat is poor. Water areas and a suitable source of food for wetland wildlife are not available.

The limitations affecting the use of this soil as a site for dwellings without basements, small commercial buildings, local roads and streets, and septic tank absorption fields are severe. The seasonal high water table and poor filtration are the main limitations. A deep drainage system is needed. Mounding may be needed on sites for septic tank absorption fields. If the density of housing is moderate or high, community sewage systems may be needed to prevent the contamination of ground water by seepage.

This soil has severe limitations as a site for recreational uses. The seasonal high water table and the loose, sandy surface layer severely limit trafficability. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

This soil is in capability subclass IVw and is assigned the woodland ordination symbol 8W.

15—Blanton fine sand, 0 to 5 percent slopes. This soil is nearly level and gently sloping and is moderately well drained. It is on slight knolls and ridges in the uplands. Individual areas are irregular in shape and generally range from 10 to more than 800 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is dark gray fine sand about 6 inches thick. The subsurface layer is fine sand. It extends to a depth of about 44 inches. The upper 23 inches is light yellowish brown, and the lower 15 inches is very pale brown. The subsoil extends to a depth of about 80 inches. The upper 16 inches is brownish yellow sandy clay loam, and the lower 20 inches is gray sandy clay loam.

On 80 percent of the acreage mapped as Blanton fine sand, 0 to 5 percent slopes, Blanton and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Ridgewood and Penney soils and soils that are underlain by spodic material. Other included soils are similar to Blanton fine sand but have higher base saturation. Individual areas of included soils are smaller than 5 acres.

Permeability is moderate in the Blanton soil. The available water capacity is low. Runoff is slow. The seasonal high water table is at a depth of 48 to 72 inches for 1 to 5 months during most years.

Most areas of this soil support natural vegetation, mainly live oak, laurel oak, post oak, water oak, sweetgum, laurelcherry, slash pine, loblolly pine, and longleaf pine. The understory is mainly lopsided indiangrass, hairy panicum, low panicum, greenbrier, hawthorn, persimmon, fringeleaf paspalum, hairy tickclover, dwarf huckleberry, chalky bluestem, creeping bluestem, and pineland threeawn.

This soil has severe limitations if it is used for cultivated crops. Because of the sandy texture, it does not retain sufficient moisture during dry periods. Plant nutrients are leached rapidly. Corn, peanuts, soybeans, tobacco, and watermelons can be grown but require intensive management measures and conservation practices, such as including cover crops in the crop rotation, returning crop residue to the soil, and applying fertilizer and lime. Irrigation is needed during droughty periods. Soil blowing is a severe hazard if the surface layer is exposed.

This soil is well suited to improved pasture. Deep-rooted grasses, such as bahiagrass and improved bermudagrass, are suitable, but yields are generally reduced by periodic drought. Careful management is required to keep the pasture in good condition. This management includes establishment of a proper plant population, applications of fertilizer and lime, and controlled grazing. Irrigation can improve the quality of the pasture and of hay. It may be economical if irrigation water is available during extended dry periods. The soil is not suited to shallow-rooted pasture plants because it does not retain sufficient moisture in the root zone.

The potential productivity of this soil for pine trees is high. Slash pine, loblolly pine, and longleaf pine are suitable for planting. Using equipment that has large tires or tracks can help to overcome the equipment limitation caused by the loose, sandy surface layer. Lack of available water in the root zone during dry periods can cause excessive seedling mortality and can reduce the growth rate. Plant competition from hardwoods, mainly oaks, can be controlled by good site preparation, which should include chopping and applications of herbicide. Selection of special planting stock that is larger than is typical or that is containerized reduces the seedling mortality rate. Planting during periods when rainfall is heavier and more frequent increases the seedling survival and growth rates. All plant debris should be left on the site. The trees respond well to applications of fertilizer.

The potential of this soil for openland and woodland wildlife habitat is fair, and the potential for wetland wildlife habitat is very poor. Water areas and a suitable source of food for wetland wildlife are not available.

The limitations affecting the use of this soil as a site for dwellings without basements, for small commercial buildings, and for local roads and streets are slight. Wetness is a moderate limitation on sites for septic tank absorption fields.

This soil has severe limitations as a site for recreational uses. The loose, sandy surface layer severely limits trafficability in unpaved areas. Soil blowing is a hazard. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

This soil is in capability subclass IIIs and is assigned the woodland ordination symbol 11S.

16—Elloree-Osier-Fluvaquents complex, frequently flooded. These soils are nearly level and are poorly drained or very poorly drained. They are on flood plains and in narrow or broad, elongated drainageways. Individual areas are irregular in shape and range from about 100 to more than 300 acres in size. Slopes are nearly smooth and are 0 to 2 percent.

Typically, the surface layer of the Elloree soil is very dark grayish brown loamy fine sand about 4 inches thick. The subsurface layer is light brownish gray and light gray loamy fine sand. It extends to a depth of about 25 inches. The subsoil is gray and light gray sandy clay loam, which extends to a depth of about 62 inches. Below this to a depth of about 80 inches is white sand.

Typically, the surface layer of the Osier soil is very dark gray fine sand about 7 inches thick. The underlying material to a depth of about 80 inches is fine sand. The upper 4 inches is gray, the next 8 inches is light brownish gray, the next 41 inches is light gray, and the lower 20 inches is white.

Typically, the surface layer of the Fluvaquents is black mucky fine sand about 2 inches thick. The underlying strata extend to a depth of 80 inches or

more. In sequence downward, they commonly are dark gray sandy clay loam, pale brown silt loam that has many fine and medium white shell fragments, very dark gray silt loam that has few white shell fragments, very pale brown sandy loam that has many fine and medium white shell fragments, light yellowish brown sandy loam that has pockets of white sand, and white sand that has many white shell fragments.

On 95 percent of the acreage mapped as Elloree-Osier-Fluvaquents complex, frequently flooded, Elloree and Osier soils, Fluvaquents, and similar soils make up 92 to 99 percent of the mapped areas. Generally, the mapped areas are about 40 percent Elloree and similar soils, 35 percent Osier and similar soils, and 20 percent Fluvaquents and similar soils. Dissimilar soils make up about 1 to 8 percent of the areas. On 5 percent of the acreage, the dissimilar soils make up either less than 1 percent or more than 8 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Garcon and Ridgewood soils and soils that are better drained than the Elloree and Osier soils and the Fluvaquents and are flooded for shorter periods. Other included soils are similar to the Elloree soil but are somewhat poorly drained. These soils are on some of the higher parts of the landscape. Also included are soils that are similar to the Osier soil but have a control section in which the combined content of silt and clay is 0 to 5 percent. Individual areas of included soils are smaller than 5 acres.

Permeability is moderately rapid or rapid in the Elloree and Osier soils and in the Fluvaquents. The available water capacity is low or moderate. The seasonal high water table is within a depth of 12 inches for long periods during most years. Runoff is slow. Flooding occurs during most years.

Most areas support natural vegetation, mainly baldcypress, sweetgum, sweetbay, red maple, water oak, loblolly pine, and slash pine. Unless major water-control systems are installed, these soils are unsuited to cultivated crops, tame pasture, and planted pine trees because of flooding and prolonged wetness.

The potential of these soils for openland and woodland wildlife habitat is fair or poor, and the potential for wetland wildlife habitat is fair or good.

The limitations affecting the development of these soils for recreational and urban uses, including septic tank absorption fields, dwellings, small commercial buildings, and local roads and streets, are severe. Flooding and wetness are the major limitations. A good drainage system is needed. It should be able to remove excess water rapidly during periods of flooding and wetness and should adequately control the water table. The high water table can prevent adequate filtration of the effluent in septic tank absorption fields. Inadequate filtration can result in the contamination of ground water.

These soils are in capability subclass VIw. The Elloree and Osier soils are assigned the woodland ordination symbol 11W, and the Fluvaquents are not assigned a woodland ordination symbol.

18—Kershaw fine sand, gently rolling. This soil is nearly level and gently sloping and is excessively drained. It is on uplands. Individual areas are irregular in shape and range from about 15 to more than 1,500 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is very dark grayish brown fine sand about 5 inches thick. The underlying material to a depth of about 80 inches is fine sand. The upper 40 inches is pale brown, and the lower 35 inches is very pale brown.

On 80 percent of the acreage mapped as Kershaw fine sand, gently rolling, Kershaw and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Albany and Wadley soils and various soils that are underlain by soft limestone bedrock. Other included soils are similar to Kershaw fine sand but have lamellae. Individual areas of included soils are smaller than 5 acres.

Permeability is very rapid in the Kershaw soil. The available water capacity is very low. Surface runoff is slow. The water table is below a depth of 6 feet.

Most areas of this soil support natural vegetation, mainly turkey oak, bluejack oak, sand live oak, blackjack oak, and a few longleaf pines. The understory is mainly a sparse cover of pineland threeawn, indiangrass, chalky bluestem, and panicum.

This soil has very severe limitations if it is used for cultivated crops. Because of the sandy texture, it does not retain sufficient moisture during dry periods. Plant nutrients are leached rapidly. Corn, peanuts, and watermelons can be grown but require intensive management measures and conservation practices, such as including cover crops in the crop rotation, returning crop residue to the soil, and applying fertilizer and lime. Irrigation is needed during droughty periods. Soil blowing is a severe hazard if the surface layer is exposed.

This soil is poorly suited to tame pasture. Deep-rooted grasses, such as bahiagrass and bermudagrass, are suitable, but yields are generally reduced by periodic drought. Careful management is required to keep the pasture in good condition. This management

includes establishment of a proper plant population, applications of fertilizer and lime, and controlled grazing. Irrigation can improve the quality of the pasture and of hay. It may be economical if irrigation water is available during extended dry periods. The soil is not suited to shallow-rooted pasture plants because it does not retain sufficient moisture in the root zone.

The potential productivity of this soil for pine trees is moderate. Slash pine, longleaf pine, and sand pine are suitable for planting. The sandy texture restricts the use of wheeled equipment unless the trees are harvested when the soil is moist. Because droughtiness can result in seedling mortality, the number of trees that are planted and the planting depth should be increased and the site should be mulched with the biomass that remains after harvesting. Plant competition can be controlled by site preparation activities, such as chopping with a drum chopper. A harvesting system that leaves most of the biomass on the surface is preferred.

The potential of this soil for openland wildlife habitat is poor, and the potential for woodland and wetland wildlife habitat is very poor. Water areas and a suitable source of food for wetland wildlife are not available.

The limitations affecting the use of this soil as a site for dwellings and local roads and streets and septic tank absorption fields are slight. The slope is a moderate limitation on sites for small commercial buildings. In areas that have a concentration of homes, the contamination of ground water is a hazard because of poor filtration in septic tank absorption fields.

This soil has severe limitations as a site for recreational uses. The loose, sandy surface layer severely limits trafficability in unpaved areas. Soil blowing is a hazard. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

This soil is in capability subclass VIIs and is assigned the woodland ordination symbol 8S.

19—Sapelo fine sand. This soil is nearly level and poorly drained. It is in the broad flatwoods. Individual areas are irregularly shaped or elongated and range from about 10 to more than 100 acres in size. Slopes are smooth or concave and are 0 to 2 percent.

Typically, the surface layer is black fine sand about 5 inches thick. The subsurface layer is light brownish gray fine sand about 15 inches thick. The subsoil is fine sand that is coated with organic matter. It extends to a depth of about 29 inches. It is dark brown in the upper 5 inches and dark yellowish brown in the lower 4 inches. Below this is about 6 inches of light yellowish brown fine sand and 6 inches of pale brown loamy fine sand. The lower part of the profile to a depth of about 80 inches is gray and grayish brown fine sandy loam.

On 80 percent of the acreage mapped as Sapelo fine sand, Sapelo and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are small areas of Albany and Mandarin soils. Other included soils are similar to the Sapelo soil but are somewhat poorly drained. Individual areas of included soils are smaller than 5 acres.

Permeability is moderate in the Sapelo soil. The available water capacity is low. Runoff is slow. The seasonal high water table is at a depth of 6 to 18 inches for 1 to 6 months during most years.

Some areas of this soil support natural vegetation, mainly slash pine, longleaf pine, live oak, and water oak and an understory of saw palmetto, running oak, gallberry, waxmyrtle, fetterbush, huckleberry, pineland threeawn, bluestems, briers, and brackenfern.

Wetness and low natural fertility are very severe limitations if this soil is used for cultivated crops. The number of suitable crops is limited unless intensive management is applied. If a good water-control system is installed and soil-improving measures are applied, however, the soil is suited to many crops. A water-control system is needed to remove surface excess water during wet periods and to provide water for subsurface irrigation during droughty periods. Row crops should be grown in rotation with close-growing, soil-improving cover crops. The cover crops and the residue from other crops should be used to maintain the content of organic matter and to control erosion. Seedbed preparation should include bedding of the rows. Fertilizer and lime should be applied according to the needs of the crops and the expected level of yields.

This soil is well suited to tame pasture. Improved bermudagrass, bahiagrass, and clover grow well if the pasture is well managed. A water-control system is needed to remove excess surface water during periods of heavy rainfall. Regular applications of fertilizer are needed to increase yields. Controlled grazing helps to maintain plant vigor.

The potential productivity of this soil for pine trees is moderately high. Slash pine and loblolly pine are suitable for planting. Timely site preparation activities, such as harrowing and bedding, help to establish seedlings, reduce the seedling mortality rate, and increase the early growth rate. Chopping and bedding remove debris, control competing vegetation, and facilitate planting. Logging with machinery equipped with large tires or tracks facilitates the use of equipment and minimizes compaction and root damage during

thinning activities. Logging systems that leave the residual biomass well distributed throughout the site can help to maintain the content of organic matter and improve the fertility of the soil. The trees respond well to applications of fertilizer.

The potential of this soil for openland, woodland, and wetland wildlife habitat is fair.

The limitations affecting the use of this soil as a site for dwellings without basements, small commercial buildings, local roads and streets, and septic tank absorption fields are severe. The seasonal high water table and poor filtration are the main limitations. A deep drainage system is needed. Mounding may be needed on sites for septic tank absorption fields. If the density of housing is moderate or high, community sewage systems may be needed to prevent the contamination of ground water by seepage.

This soil has severe limitations as a site for recreational uses. The seasonal high water table and the loose, sandy surface layer severely limit trafficability. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

This soil is in capability subclass IVw and is assigned the woodland ordination symbol 10W.

20—Pamlico-Dorovan mucks, frequently flooded. These soils are nearly level and are very poorly drained. They are in swamps on low flood plains in the flatwoods. Individual areas are irregular in shape and range from about 5 to more than 60 acres in size. Slopes are 0 to 1 percent and are nearly smooth.

Typically, the surface layer of the Pamlico soil is dark brown muck about 18 inches thick. The next layer is very dark gray muck. It extends to a depth of about 38 inches. The underlying material to a depth of about 80 inches is grayish brown fine sand.

Typically, the surface layer of the Dorovan soil is black muck about 6 inches thick. Below this is about 28 inches of dark reddish brown muck and 31 inches of very dark grayish brown muck. The underlying material to a depth of 80 inches or more is gray fine sand.

On 95 percent of the acreage mapped as Pamlico and Dorovan mucks, frequently flooded, Pamlico, Dorovan, and similar soils make up 80 to 100 percent of the mapped areas. Dissimilar soils make up about 0 to 20 percent of the areas. On 0 to 20 percent of the acreage, the dissimilar soils make up more than 20 percent of the areas. Generally, the mapped areas are about 55 percent Pamlico and similar soils and 45 percent Dorovan and similar soils. The components of this map unit occur as areas so intricately intermingled that mapping them separately is not practical. The proportions and patterns of the Pamlico, Dorovan, and similar soils, however, are relatively consistent in most of the mapped areas.

The dissimilar soils included in this map unit are small areas of Allanton, Lynn Haven, and Surrency soils. Individual areas of included soils are smaller than 5 acres.

Permeability is moderately rapid or rapid in the Pamlico and Dorovan soils. Internal drainage is slow, however, because it is impeded by a high water table. The water table is above the surface during wet periods. It recedes to a depth of more than 20 inches during dry periods. The available water capacity is very high.

Most areas support natural vegetation, mainly pondcypress, baldcypress, blackgum, sweetbay, red maple, and swamp tupelo. The understory is dominantly cordgrass, bullrush, buttonbush, elderberry, water hyacinth, arrowhead, and dollarwort. Unless major water-control systems are installed, these soils are unsuited to cultivated crops, tame pasture, and planted pine trees because of flooding and prolonged wetness.

The potential of these soils for openland and woodland wildlife habitat is poor or very poor. The flooded areas do not provide desirable habitat for these kinds of wildlife, and attempts to improve the openland or woodland habitat would be unsatisfactory. The potential for wetland wildlife habitat is good.

The limitations affecting the development of these soils for recreational and urban uses, including septic tank absorption fields, dwellings, small commercial buildings, and local roads and streets, are severe. Flooding and excess humus are the major limitations. Overcoming these limitations is very difficult.

These soils are in capability subclass VIIw and are assigned the woodland ordination symbol 2W.

21—Bonneau fine sand, 0 to 5 percent slopes. This soil is nearly level and gently sloping and is moderately well drained. It is on slight knolls. Individual areas are irregular in shape and range from about 10 to more than 800 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is very dark gray fine sand about 6 inches thick. The subsurface layer is fine sand. It extends to a depth of about 35 inches. The upper 10 inches is light yellowish brown, and the lower 19 inches is very pale brown. The subsoil to a depth of about 80 inches is sandy clay loam. The upper 9 inches is yellowish brown, the next 25 inches is light yellowish brown, and the lower 11 inches is mottled gray, yellowish brown, and strong brown.

On 80 percent of the acreage mapped as Bonneau

fine sand, 0 to 5 percent slopes, Bonneau and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Meggett and Ortega soils and soils that are underlain by limestone bedrock. Other included soils are similar to Bonneau fine sand but have higher base saturation. Individual areas of included soils are smaller than 5 acres.

Permeability is moderate in the Bonneau soil. The available water capacity is low. Runoff is slow. The seasonal high water table is at a depth of 48 to 60 inches for 1 to 5 months during most years.

Most areas of this soil support natural vegetation, mainly live oak, laurel oak, post oak, water oak, hickory, laurelcherry, slash pine, loblolly pine, and longleaf pine. The understory is mainly lopsided indiangrass, hairy panicum, low panicum, greenbrier, hawthorn, persimmon, fringeleaf paspalum, hairy tickclover, dwarf huckleberry, chalky bluestem, creeping bluestem, and pineland threeawn.

This soil has moderate limitations if it is used for cultivated crops. Because of the sandy texture, it does not retain sufficient moisture during dry periods. Plant nutrients are leached rapidly. Corn, peanuts, soybeans, tobacco, and watermelons can be grown but require intensive management measures and conservation practices, such as including cover crops in the crop rotation, returning crop residue to the soil, and applying fertilizer and lime. Irrigation is needed during droughty periods. Soil blowing is a severe hazard if the surface layer is exposed.

This soil is well suited to tame pasture. It is moderately well suited to improved bermudagrass and bahiagrass if the pasture is well managed. Productive pastures of grass alone or of grass-legume mixtures can be established if good management is applied. The best yields require applications of fertilizer and lime and carefully controlled grazing.

The potential productivity of this soil for pine trees is high. Loblolly pine, slash pine, and longleaf pine are suitable for planting. Using equipment that has large tires or tracks can help to overcome the equipment limitation caused by the loose, sandy surface layer. Lack of available water in the root zone during dry periods can cause excessive seedling mortality and can reduce the growth rate. Plant competition from hardwoods, mainly oaks, can be controlled by good site preparation, which should include chopping and applications of herbicide. Selection of special planting stock that is larger than is typical or that is containerized reduces the seedling mortality rate. Planting during periods when rainfall is heavier and more frequent increases the seedling survival and growth rates. All plant debris should be left on the site. The trees respond well to applications of fertilizer.

The potential of this soil for openland and woodland wildlife habitat is good, and the potential for wetland wildlife habitat is poor. Water areas and a suitable source of food for wetland wildlife are not available.

The limitations affecting the use of this soil as a site for dwellings without basements, for small commercial buildings, and for local roads and streets are slight. Wetness is a moderate limitation on sites for septic tank absorption fields.

This soil has moderate limitations as a site for recreational uses. The loose, sandy surface layer severely limits trafficability in unpaved areas. Soil blowing is a hazard. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

This soil is in capability subclass IIs and is assigned the woodland ordination symbol 11S.

22—Mandarin fine sand. This soil is nearly level and somewhat poorly drained. It is on slight rises in the flatwoods. Individual areas are irregular in shape and range from about 5 to more than 100 acres in size. Slopes are 0 to 2 percent.

Typically, the surface layer is dark gray fine sand about 6 inches thick. The subsurface layer is light gray fine sand. It extends to a depth of about 20 inches. The upper part of the subsoil is black and dark reddish brown fine sand in which the sand grains are well coated with organic matter. The next part is pale brown and brown fine sand. The lower part to a depth of about 80 inches is black fine sand in which the sand grains are coated with organic matter.

On 80 percent of the acreage mapped as Mandarin fine sand, Mandarin and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Ortega and Ridgewood soils. Individual areas of included soils are smaller than 5 acres.

Permeability is moderate in the Mandarin soil. The available water capacity is low. The seasonal high water table is at a depth of 18 to 42 inches for 1 to 6 months during most years.

Most areas of this soil support natural vegetation,

mainly slash pine, longleaf pine, post oak, live oak, and water oak. The understory is mainly greenbrier, saw palmetto, running oak, waxmyrtle, pineland threeawn, bluestems, dwarf huckleberry, carpetgrass, and panicum.

This soil has very severe limitations if it is used for cultivated crops. Because of the sandy texture, it does not retain sufficient moisture during dry periods. The water table may restrict root development during wet periods.

This soil is moderately well suited to tame pasture. Bahiagrass and improved bermudagrass can produce high-quality forage if a high level of management is applied. This management includes establishment of a proper plant population, applications of fertilizer and lime, and controlled grazing.

The potential productivity of this soil for pine trees is moderate. Slash pine and longleaf pine are suitable for planting. Proper site preparation activities, such as harrowing and bedding, help to establish seedlings, reduce the seedling mortality rate, and increase the early growth rate. Chopping and bedding remove debris, control competing vegetation, and facilitate planting. Logging with machinery equipped with large tires or tracks facilitates the use of equipment and minimizes compaction and root damage during thinning activities. Logging systems that leave the residual biomass well distributed throughout the site increase the organic matter content and improve the fertility of the soil. The trees respond well to applications of fertilizer.

The potential of this soil for openland and woodland wildlife habitat is poor, and the potential for wetland wildlife habitat is very poor.

The limitations affecting the use of this soil as a site for dwellings without basements, small commercial buildings, and local roads and streets are moderate. The limitations on sites for septic tank absorption fields are severe. The seasonal high water table hinders the downward movement of effluent and prevents adequate filtration. A deep drainage system is needed. Mounding of the absorption fields may be needed. If the density of housing is moderate or high, community sewage systems may be needed to prevent the contamination of ground water by seepage.

This soil has severe limitations as a site for recreational uses. The loose, sandy surface layer severely limits trafficability in unpaved areas. During the drier periods, soil blowing is a hazard. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

This soil is in capability subclass VIs and is assigned the woodland ordination symbol 8S.

24—Quartzipsamments, excavated. These soils are in excavated areas where soil material has been removed for use in road construction and for use as fill material in the preparation of building sites. The excavations are known locally as borrow pits. Individual areas are irregular in shape. They range from about 5 to more than 40 acres in size and are about 5 to 12 feet deep. Excavations that are too small to be delineated are identified by the standard pick-and-shovel symbol on the soil maps.

Included in mapping are wet spots, eroded areas, areas where siltation and deposition have recently occurred, and a sanitary landfill.

In most areas of the Quartzipsamments, the water table is below a depth of 60 inches. In some areas it is at a depth of about 24 to 96 inches during wet periods.

Under present conditions, these soils are not suited to crops, tame pasture, urban uses, or most recreational uses. If the landscape were reshaped and vegetated, the potential for these uses would vary, depending on the location of the site. The potential for wildlife habitat generally is poor or fair. The potential for commercial woodland varies.

These soils are not assigned a capability subclass or woodland ordination symbol.

25—Wesconnett mucky fine sand, depressional. This soil is nearly level and very poorly drained. It is in shallow depressions and poorly defined drainageways in the flatwoods. Individual areas are irregular in shape and range from about 5 to more than 400 acres in size.

Typically, the surface layer is black mucky fine sand about 8 inches thick. The subsoil to a depth of about 80 inches is fine sand. The upper 20 inches is very dark brown and has sand grains that are well coated with organic matter, the next 13 inches is dark brown, the next 11 inches is brown, and the lower 28 inches is black and has sand grains that are coated with organic matter.

On 80 percent of the acreage mapped as Wesconnett mucky fine sand, depressional, Wesconnett and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Hurricane, Leon, Pamlico, and Pottsburg soils. Individual areas of included soils are smaller than 5 acres.

Permeability is moderate or moderately rapid in the Wesconnett soil. Internal drainage is slow, however, because it is impeded by a high water table. The water

table is above the surface during wet periods. It recedes to a depth of more than 20 inches during dry periods. The available water capacity is low.

Most areas support natural vegetation, mainly cypress. Sweetbay, blackgum, and red maple grow in some areas. A few areas support water-tolerant grasses. Unless major water-control systems are installed, this soil is unsuited to cultivated crops, tame pasture, and planted pine trees because of ponding and prolonged wetness.

The potential of this soil for openland and woodland wildlife habitat is very poor. The ponded areas do not provide desirable habitat for these kinds of wildlife, and attempts to improve the openland or woodland habitat would be unsatisfactory. The potential for wetland wildlife habitat is good.

The limitations affecting the development of this soil for recreational and urban uses, including septic tank absorption fields, dwellings, small commercial buildings, and local roads and streets, are severe. Ponding and wetness are the major limitations. A major drainage system and fill material are needed. The drainage system should be able to remove excess water rapidly during periods of flooding and wetness and should adequately control the water table. The high water table can prevent adequate filtration of the effluent in septic tank absorption fields. Inadequate filtration can result in the contamination of ground water.

This soil is in capability subclass VIIw and is assigned the woodland ordination symbol 2W.

26—Surrency mucky fine sand, depressional. This soil is nearly level and very poorly drained. It is in shallow depressions and poorly defined drainageways. Individual areas generally are circular and range from about 20 to more than 40 acres in size. Slopes are less than 2 percent.

Typically, the upper 12 inches of the surface layer is very dark brown mucky fine sand, and the lower 4 inches is very dark gray fine sand. The subsurface layer is grayish brown fine sand. It extends to a depth of about 34 inches. The subsoil to a depth of 80 inches or more is gray sandy clay loam.

On 80 percent of the acreage mapped as Surrency mucky fine sand, depressional, Surrency and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Leon and Pamlico soils and various soils that have a thick surface layer of organic material. Other included soils are similar to Surrency mucky fine sand but are more than 40 inches deep to a Btg horizon. Individual areas of included soils are smaller than 5 acres.

Permeability is moderate in the Surrency soil. Internal drainage is slow, however, because it is impeded by a high water table. The water table is above the surface during wet periods. It recedes to a depth of more than 20 inches during dry periods. The available water capacity is low.

Most areas support natural vegetation, mainly cypress. Swamp tupelo, loblolly pine, slash pine, pond pine, sweetbay, and other water-tolerant hardwoods grow in some areas. A few areas support water-tolerant grasses. Unless major water-control systems are installed, this soil is unsuited to cultivated crops, tame pasture, and planted pine trees because of ponding and prolonged wetness.

The potential of this soil for openland and woodland wildlife habitat is poor. The ponded areas do not provide desirable habitat for these kinds of wildlife, and attempts to improve the openland or woodland habitat would be unsatisfactory. The potential for wetland wildlife habitat is fair.

The limitations affecting the development of this soil for recreational and urban uses, including septic tank absorption fields, dwellings, small commercial buildings, and local roads and streets, are severe. Ponding and wetness are the major limitations. A major drainage system and fill material are needed. The drainage system should be able to remove excess water rapidly during periods of flooding and wetness and should adequately control the water table. The high water table can prevent adequate filtration of the effluent in septic tank absorption fields. Inadequate filtration can result in the contamination of ground water.

This soil is in capability subclass VIw and is assigned the woodland ordination symbol 2W.

27—Leon fine sand, frequently flooded. This soil is nearly level and poorly drained. It is on flood plains and adjacent to drainageways. Individual areas are irregular in shape and range from about 50 to more than 200 acres in size. Slopes are nearly smooth and are 0 to 2 percent. Small areas where slopes are slightly convex are within short distances.

Typically, the surface layer is very dark gray fine sand about 6 inches thick. The subsurface layer is grayish brown and light brownish gray fine sand about 15 inches thick. The subsoil is fine sand that is coated with organic matter. It extends to a depth of about 60 inches. It is black in the upper 7 inches, dark reddish brown in the next 12 inches, and grayish brown in the lower 20 inches. The substratum to a depth of about 80 inches is very pale brown fine sand.

On 80 percent of the acreage mapped as Leon fine sand, frequently flooded, Leon and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Allanton, Lynn Haven, Sapelo, and Surrency soils and soils that have an organic surface layer. Individual areas of included soils are smaller than 5 acres.

Permeability is moderate or moderately rapid in the Leon soil. The available water capacity is low. Runoff is slow. The water table is above the surface during wet periods. It recedes to a depth of more than 20 inches during dry periods. Flooding occurs during most years.

Most areas support natural vegetation, mainly longleaf pine, slash pine, a few scattered live oaks and water oaks, and an understory of saw palmetto, running oak, gallberry, waxmyrtle, huckleberry, pineland threeawn, bluestems, briers, brackenfern, and other native forbs and grasses. Unless major water-control systems are installed, this soil is unsuited to cultivated crops and improved pasture because of flooding and prolonged wetness.

The potential productivity of this soil for pine trees is moderate. Slash pine is suitable for planting. Seasonal flooding and wetness restrict the use of wheeled equipment. The trees should be harvested during the drier periods. Seedling mortality can result from the flooding. Good site preparation and bedding can reduce the seedling mortality rate. Plant competition can be controlled by site preparation activities, such as chopping with a drum chopper. A harvesting system that leaves most of the biomass on the surface is preferred.

The potential of this soil for openland and woodland wildlife habitat is fair. The potential for wetland wildlife habitat is poor.

The limitations affecting the development of this soil for recreational and urban uses, including septic tank absorption fields, dwellings, small commercial buildings, and local roads and streets, are severe. Flooding, wetness, and poor filtration are the major limitations. Measures that protect the site from flooding and adequately control the water table are needed. The high water table can prevent adequate filtration of the effluent in septic tank absorption fields. Inadequate filtration can result in the contamination of ground water.

This soil is in capability subclass VIw and is assigned the woodland ordination symbol 8W.

29—Shadeville-Otela fine sands, 0 to 5 percent slopes. These soils are nearly level and gently sloping and are moderately well drained. They are on uplands. Sinkholes are common in some areas. Individual areas are irregular in shape and range from about 10 to more than 1,000 acres in size. Slopes are convex or concave.

Typically, the surface layer of the Shadeville soil is very dark gray fine sand about 9 inches thick. The subsurface layer is grayish brown and pale brown fine sand. It extends to a depth of about 32 inches. The subsoil is very pale brown sandy clay loam about 6 inches thick and light brownish gray sandy clay loam about 4 inches thick. Limestone bedrock is at a depth of about 42 inches. It varies considerably over short distances.

Typically, the surface layer of the Otela soil is dark grayish brown fine sand about 10 inches thick. The subsurface layer extends to a depth of about 51 inches. The upper part is light yellowish brown fine sand, and the lower part is very pale brown fine sand that has thin bands of sandy loam. The upper 11 inches of the subsoil is light yellowish brown sandy clay loam. The lower part to a depth of about 80 inches is light gray sandy clay loam.

On 80 percent of the acreage mapped as Shadeville-Otela fine sands, 0 to 5 percent slopes, Shadeville, Otela, and similar soils make up 80 to 95 percent of the mapped areas. Generally, the mapped areas are about 55 percent Shadeville and similar soils and 35 percent Otela and similar soils. The components of this map unit occur as areas so intricately intermingled that mapping them separately is not practical. The proportions and patterns of the Shadeville, Otela, and similar soils, however, are relatively consistent in most of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are small areas of Blanton, Bonneau, Penney, and Wadley soils; somewhat poorly drained soils; and soils that consist of sandy material over bedrock. Individual areas of included soils are smaller than 5 acres.

Permeability is slow in the Shadeville soil and moderately slow or slow in the Otela soil. The available water capacity is moderate in the Shadeville soil and low in the Otela soil. During wet periods the seasonal high water table is perched above the layers of sandy clay loam in both soils for brief periods. Depth to the water table ranges from 48 to more than 72 inches.

Some areas of these soils support natural vegetation, mainly laurel oak, live oak, turkey oak, slash pine, longleaf pine, hickory, and scattered saw palmettoes.

These soils are moderately well suited to cultivated

crops. Because of the sandy texture, they do not retain sufficient moisture during dry periods. Corn, peanuts, soybeans, tobacco, and watermelons can be grown but require good management measures and conservation practices, such as including cover crops in the crop rotation, returning crop residue to the soils, and applying fertilizer and lime. Irrigation is desirable during droughty periods. Soil blowing is a severe hazard if the surface layer is exposed.

These soils are well suited to tame pasture. Fertilizer and lime are needed for the optimum growth of grasses and legumes. The low available water capacity limits forage production during extended dry periods. Deep-rooted plants, such as improved bermudagrass and bahiagrass, are more tolerant of drought if fertilizer and lime are applied. Proper stocking rates, pasture rotation, and other measures that prevent overgrazing help to keep the pasture in good condition.

The potential productivity of these soils for pine trees is moderately high. Slash pine, loblolly pine, longleaf pine, and sand pine are suitable for planting. The sandy texture restricts the use of wheeled equipment unless the trees are harvested when the soils are moist. Because droughtiness can result in seedling mortality, the number of trees that are planted and the planting depth should be increased and the site should be mulched with the biomass that remains after harvesting. Proper site preparation activities, such as applying herbicide and chopping, help to control competing vegetation and facilitate mechanical planting. The extent of the hardwood understory can be reduced by controlled burning, applications of herbicide, girdling, or cutting. Harvesting systems that leave most of the biomass on the surface are preferred. The trees respond well to applications of fertilizer.

The potential of these soils for openland and woodland wildlife habitat is fair, and the potential for wetland wildlife habitat is very poor. Water areas and a suitable source of food for wetland wildlife are not available.

The limitations affecting the use of these soils as sites for dwellings without basements, small commercial buildings, and local roads and streets are slight. The limitations on sites for septic tank absorption fields are moderate. The contamination of ground water is a hazard in areas where limestone bedrock is close to the surface and in areas that have a concentration of homes.

These soils have severe limitations as sites for recreational uses. The loose, sandy surface layer severely limits trafficability in unpaved areas. Soil blowing is a hazard. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

The Shadeville soil is in capability subclass IIs and is assigned the woodland ordination symbol 11S. The Otela soil is in capability subclass IIIs and is assigned the woodland ordination symbol 10S.

30—Fluvaquents, frequently flooded. These soils are nearly level and are poorly drained or very poorly drained. They are on flood plains. They consist mainly of sandy, loamy, and clayey strata. In some areas, however, they have organic layers. The texture varies widely within short distances. Individual areas are elongated and range from about 50 to more than 300 acres in size. Slopes are 0 to 2 percent.

Typically, the surface layer is black mucky fine sand about 2 inches thick. The underlying strata extend to a depth of about 80 inches. In sequence downward, they commonly are dark gray sandy clay loam, pale brown silt loam that has many fine and medium white shell fragments, very dark gray silt loam that has few white shell fragments, very pale brown sandy loam that has many fine and medium white shell fragments, light yellowish brown sandy loam that has pockets of white sand, and white sand that has many white shell fragments.

On 80 percent of the acreage mapped as Fluvaquents, frequently flooded, Fluvaquents make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Elloree and Osier soils. Other included soils are similar to the Fluvaquents but are better drained and are flooded for shorter periods. Individual areas of included soils are smaller than 5 acres.

Permeability is moderate in the Fluvaquents. The available water capacity is low. The water table is at the surface during wet periods. It recedes to a depth of more than 20 inches during dry periods. Flooding occurs during most years.

Most areas support natural vegetation, mainly baldcypress, sweetgum, sweetbay, red maple, and water oak. Unless major water-control systems are installed, these soils are unsuited to cultivated crops, tame pasture, and planted pine trees because of flooding and prolonged wetness.

The potential of these soils for openland, woodland, and wetland wildlife habitat is fair.

The limitations affecting the development of these soils for recreational and urban uses, including septic tank absorption fields, dwellings, small commercial buildings, and local roads and streets, are severe. Flooding and wetness are the major limitations. A major

drainage system and fill material are needed. The drainage system should be able to remove excess water rapidly during periods of flooding and wetness and should adequately control the water table. The high water table can prevent adequate filtration of the effluent in septic tank absorption fields. Inadequate filtration can result in the contamination of ground water.

These soils are in capability subclass VIIw. They are not assigned a woodland ordination symbol.

32—Meggett fine sand, frequently flooded. This soil is nearly level and poorly drained. It is on flood plains and adjacent to drainageways. Individual areas are irregular in shape and range from about 15 to 150 acres in size. Slopes are nearly smooth and are 0 to 2 percent. Small areas where slopes are slightly convex are within short distances.

Typically, the surface layer is very dark brown fine sand about 4 inches thick. The subsurface layer is light brownish gray fine sand. It extends to a depth of about 11 inches. The subsoil is sandy clay about 29 inches thick. The upper part is light brownish gray. The lower part is mottled gray and yellowish brown and has concretions of calcium carbonate. The substratum to a depth of about 80 inches is white sandy clay loam that has many concretions of calcium carbonate.

On 80 percent of the acreage mapped as Meggett fine sand, frequently flooded, Meggett and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Albany, Elloree, and Shadeville soils and soils that are underlain by soft limestone bedrock. Individual areas of included soils are smaller than 5 acres.

Permeability is slow in the Meggett soil. The available water capacity is moderate. Runoff is very slow. The seasonal high water table is within a depth of 12 inches for long periods during most years. Flooding occurs during most years.

Most areas support natural vegetation, mainly scattered slash pine, loblolly pine, water oak, sweetgum, blackgum, maple, waxmyrtle, saw palmetto, and gallberry. Unless major water-control systems are installed, this soil is unsuited to cultivated crops, tame pasture, and planted pine trees because of flooding and prolonged wetness.

The potential of this soil for wetland and woodland wildlife habitat is good. The soil is suitable for the development of shallow water areas that can be used by wetland wildlife. The potential for openland wildlife habitat is fair.

The limitations affecting the development of this soil for recreational and urban uses, including septic tank absorption fields, dwellings, small commercial buildings, and local roads and streets, are severe. Flooding and wetness are the major limitations. A major drainage system and fill material are needed. The drainage system should be able to remove excess water rapidly during periods of flooding and wetness and should adequately control the water table. The high water table can prevent adequate filtration of the effluent in septic tank absorption fields. Inadequate filtration can result in the contamination of ground water.

This soil is in capability subclass VIw and is assigned the woodland ordination symbol 13W.

33—Eunola-Bonneau fine sands, 0 to 5 percent slopes. These soils are nearly level and gently sloping and are moderately well drained. They are on uplands. Sinkholes are common in some areas. Individual areas are irregular in shape and range from about 10 to more than 1,000 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer of the Eunola soil is very dark grayish brown fine sand about 9 inches thick. The subsurface layer is pale brown fine sand. It extends to a depth of about 19 inches. The subsoil extends to a depth of about 63 inches. The upper 7 inches is yellowish brown fine sandy loam, the next 9 inches is yellowish brown sandy clay loam, and the lower 28 inches is mottled fine sandy loam. The substratum to a depth of about 80 inches is light gray fine sandy loam.

Typically, the surface layer of the Bonneau soil is very dark grayish brown fine sand about 6 inches thick. The subsurface layer is fine sand. It extends to a depth of about 35 inches. The upper 10 inches is light yellowish brown, and the lower 19 inches is very pale brown. The subsoil to a depth of about 80 inches is sandy clay loam. The upper 9 inches is yellowish brown, the next 25 inches is light yellowish brown, and the lower 11 inches is mottled gray, yellowish brown, and strong brown.

On 80 percent of the acreage mapped as Eunola-Bonneau fine sands, 0 to 5 percent slopes, Eunola, Bonneau, and similar soils make up 80 to 95 percent of the mapped areas. Generally, the mapped areas are about 55 percent Eunola and similar soils and 30 percent Bonneau and similar soils. The components of this map unit occur as areas so intricately intermingled that mapping them separately is not practical. The proportions and patterns of the Eunola, Bonneau, and similar soils, however, are relatively consistent in most of the mapped areas. Dissimilar soils make up about 5

to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are small areas of Albany, Penney, and Wadley soils; somewhat poorly drained soils; and soils that consist of sandy material over bedrock. Individual areas of included soils are smaller than 5 acres.

Permeability is moderate in the Eunola and Bonneau soils. The available water capacity also is moderate. Runoff is slow. The water table is perched above the layers of sandy clay loam during wet periods. Depth to the water table ranges from less than 20 inches to 60 inches.

Some areas of these soils support natural vegetation, mainly live oak, laurel oak, post oak, water oak, hickory, laurelcherry, slash pine, loblolly pine, and longleaf pine. The understory is mainly lopsided indiangrass, hairy panicum, low panicum, greenbrier, hawthorn, persimmon, fringeleaf paspalum, hairy tickclover, dwarf huckleberry, chalky bluestem, creeping bluestem, and pineland threeawn.

These soils have moderate limitations if they are used for cultivated crops. The seasonal high water table and the sandy surface layer limit the number of suitable crops. Row crops should be grown in rotation with cover crops at least half the time. The cover crops and the residue of all crops should be used to maintain the organic matter content. The best yields require good seedbed preparation and applications of fertilizer and lime.

These soils are moderately well suited to tame pasture. They are moderately well suited to improved bermudagrass and bahiagrass if the pasture is well managed. Productive pastures of grass alone or of grass-legume mixtures can be established if good management is applied. The best yields require applications of fertilizer and lime and carefully controlled grazing.

The potential productivity of these soils for pine trees is high. Slash pine, loblolly pine, and longleaf pine are suitable for planting. Using equipment that has large tires or tracks can help to overcome the equipment limitation caused by the loose, sandy surface layer. Lack of available water in the root zone during dry periods can cause excessive seedling mortality and can reduce the growth rate. Plant competition from hardwoods, mainly oaks, can be controlled by good site preparation, which should include chopping and applications of herbicide. Selection of special planting stock that is larger than is typical or that is containerized reduces the seedling mortality rate. Planting during periods when rainfall is heavier and more frequent increases the seedling survival and growth rates. All plant debris should be left on the site. The trees respond well to applications of fertilizer.

The potential of these soils for openland and woodland wildlife habitat is good, and the potential for wetland wildlife habitat is poor. Water areas and a suitable source of food for wetland wildlife are not available.

Because of the wetness, these soils are limited as sites for dwellings, small commercial buildings, local roads and streets, and septic tank absorption fields. Adding suitable fill material helps to overcome the wetness.

These soils have severe limitations as sites for recreational uses. The loose, sandy surface layer severely limits trafficability in unpaved areas. Soil blowing is a hazard. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

The Eunola soil is in capability subclass IIw. The Bonneau soil is in capability subclass IIs. Both soils are assigned the woodland ordination symbol 11W.

34—Bonneau-Blanton fine sands, 0 to 5 percent slopes. These soils are nearly level and gently sloping and are moderately well drained. They are on uplands. Sinkholes are common in some areas. Individual areas are irregular in shape and range from about 10 to more than 1,000 acres in size. Slopes are concave or convex.

Typically, the surface layer of the Bonneau soil is very dark gray fine sand about 6 inches thick. The subsurface layer is fine sand. It extends to a depth of about 35 inches. The upper 10 inches is light yellowish brown, and the lower 19 inches is very pale brown. The subsoil to a depth of about 80 inches is sandy clay loam. The upper 9 inches is yellowish brown, the next 25 inches is light yellowish brown, and the lower 11 inches is mottled gray, yellowish brown, and strong brown.

Typically, the surface layer of the Blanton soil is very dark gray fine sand about 6 inches thick. The subsurface layer is fine sand. It extends to a depth of about 44 inches. The upper 23 inches is light yellowish brown, and the lower 15 inches is very pale brown. The subsoil extends to a depth of about 80 inches. The upper 16 inches is brownish yellow sandy clay loam, and the lower 20 inches is gray sandy clay loam.

On 80 percent of the acreage mapped as Bonneau-Blanton fine sands, 0 to 5 percent slopes, Bonneau, Blanton, and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas. Generally, the mapped areas are about 55 percent

Bonneau and similar soils and 30 percent Blanton and similar soils. The components of this map unit occur as areas so intricately intermingled that mapping them separately is not practical. The proportions and patterns of the Bonneau, Blanton, and similar soils, however, are relatively consistent in most of the mapped areas.

The dissimilar soils included in this map unit are small areas of Albany, Penney, and Wadley soils; somewhat poorly drained soils; and soils that consist of sandy material over bedrock. Individual areas of included soils are smaller than 5 acres.

Permeability is moderate in the Bonneau and Blanton soils. The available water capacity is low. Runoff is slow. The water table is perched above the layers of sandy clay loam during wet periods. Depth to the water table ranges from 48 to more than 72 inches.

Some areas support natural vegetation, mainly live oak, laurel oak, post oak, water oak, hickory, laurelcherry, slash pine, loblolly pine, and longleaf pine. The understory is mainly lopsided indiangrass, hairy panicum, low panicum, greenbrier, hawthorn, persimmon, fringeleaf paspalum, hairy tickclover, dwarf huckleberry, chalky bluestem, creeping bluestem, and pineland threeawn.

These soils have severe limitations if they are used for cultivated crops. Because of the sandy texture, they do not retain sufficient moisture during dry periods. Plant nutrients are leached rapidly. Corn, peanuts, and watermelons can be grown but require intensive management measures and conservation practices, such as including cover crops in the crop rotation, returning crop residue to the soils, and applying fertilizer and lime. Irrigation is needed during droughty periods. Soil blowing is a severe hazard if the surface layer is exposed.

These soils are well suited to tame pasture. They are moderately well suited to improved bermudagrass and bahiagrass if the pasture is well managed. Productive pastures of grass alone or of grass-legume mixtures can be established if good management is applied. The best yields require applications of fertilizer and lime and carefully controlled grazing.

The potential productivity of these soils for pine trees is high. Slash pine, loblolly pine, and longleaf pine are suitable for planting. Using equipment that has large tires or tracks can help to overcome the equipment limitation caused by the loose, sandy surface layer. Lack of available water in the root zone during dry periods can cause excessive seedling mortality and can reduce the growth rate. Plant competition from hardwoods, mainly oaks, can be controlled by good site preparation, which should include chopping and applications of herbicide. Selection of special planting stock that is larger than is typical or that is containerized reduces the seedling mortality rate. Planting during periods when rainfall is heavier and more frequent increases the seedling survival and growth rates. All plant debris should be left on the site. The trees respond well to applications of fertilizer.

The potential of these soils for openland and woodland wildlife habitat is good or fair, and the potential for wetland wildlife habitat is poor or very poor. Water areas and a suitable source of food for wetland wildlife are not available.

The limitations affecting the use of these soils as sites for dwellings without basements, for small commercial buildings, and for local roads and streets are slight. Wetness is a moderate or severe limitation on sites for septic tank absorption fields.

These soils have severe limitations as sites for recreational uses. The loose, sandy surface layer severely limits trafficability in unpaved areas. Soil blowing is a hazard. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

The Bonneau soil is in capability subclass IIs. The Blanton soil is in capability subclass IIIs. Both soils are assigned the woodland ordination symbol 11S.

35—Alpin fine sand, 0 to 5 percent slopes. This soil is nearly level and gently sloping and is excessively drained. It is on uplands. Individual areas are irregular in shape and range from about 15 to more than 300 acres in size. Slopes are nearly smooth or convex.

Typically, the surface layer is dark gray fine sand about 6 inches thick. The underlying material to a depth of about 80 inches is fine sand. The upper 12 inches is light yellowish brown. The next 33 inches is very pale brown. The lower 29 inches is very pale brown and has thin layers of yellowish brown loamy fine sand.

On 80 percent of the acreage mapped as Alpin fine sand, 0 to 5 percent slopes, Alpin and similar soils make up 80 to 95 percent of the mapped areas. Dissimilar soils make up about 5 to 20 percent of the areas. On 5 to 20 percent of the acreage, the dissimilar soils make up either less than 5 percent or more than 20 percent of the areas.

The dissimilar soils included in this map unit are some small areas of Albany and Wadley soils and various soils that are underlain by soft limestone bedrock. Other included soils are similar to Alpin fine sand but do not have lamellae. Individual areas of included soils are smaller than 5 acres.

Permeability is rapid in the Alpin soil. The available water capacity is low. Runoff is very slow. The water table is below a depth of 6 feet.

Most areas of this soil support natural vegetation, mainly turkey oak, bluejack oak, post oak, blackjack

oak, and longleaf pine. The understory is mainly a sparse cover of pineland threeawn, indiangrass, chalky bluestem, and panicum.

This soil has very severe limitations if it is used for cultivated crops. Because of the sandy texture, it does not retain sufficient moisture during dry periods. Plant nutrients are leached rapidly. Corn, peanuts, and watermelons can be grown but require intensive management measures and conservation practices, such as including cover crops in the crop rotation, returning crop residue to the soil, and applying fertilizer and lime. Irrigation is needed during droughty periods. Soil blowing is a severe hazard if the surface layer is exposed.

This soil is moderately well suited to tame pasture. Deep-rooted grasses, such as bahiagrass and improved bermudagrass, are suitable, but yields are generally reduced by periodic drought. Careful management is required to keep the pasture in good condition. This management includes establishment of a proper plant population, applications of fertilizer and lime, and controlled grazing. Irrigation can improve the quality of the pasture and of hay. It may be economical if irrigation water is available during extended dry periods. The soil is not suited to shallow-rooted pasture plants because it does not retain sufficient moisture in the root zone.

The potential productivity of this soil for pine trees is high. Slash pine, longleaf pine, and loblolly pine are suitable for planting. The sandy texture restricts the use of wheeled equipment unless the trees are harvested when the soil is moist. Because droughtiness can result in seedling mortality, the number of trees that are planted and the planting depth should be increased and the site should be mulched with the biomass that remains after harvesting. A harvesting system that leaves most of the biomass on the surface is preferred.

The potential of this soil for openland and woodland wildlife habitat is fair, and the potential for wetland wildlife habitat is very poor. Water areas and a suitable source of food for wetland wildlife are not available.

The limitations affecting the use of this soil as a site for dwellings, small commercial buildings, and local roads and streets are slight. In areas that have a concentration of homes, the contamination of ground water is a hazard because of poor filtration in septic tank absorption fields.

This soil has severe limitations as a site for recreational uses. The loose, sandy surface layer severely limits trafficability in unpaved areas. Soil blowing is a hazard. A good plant cover or windbreak is necessary. Suitable fill material or some other means of stabilizing the surface is needed.

This soil is in capability subclass IVs and is assigned the woodland ordination symbol 11S.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavioral characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for crops and pasture; as woodland; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where bedrock, wetness, or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Crops and Pasture

General management needed for crops and pasture is suggested in this section. The crops or pasture plants best suited to the soils, including some not commonly grown in the survey area, are identified; the system of land capability classification used by the Soil Conservation Service is explained; and the estimated yields of the main crops and hay and pasture plants are listed for each soil.

Planners of management systems for individual fields or farms should consider the detailed information given in the description of each soil under "Detailed Soil Map Units." Specific information can be obtained from the local office of the Soil Conservation Service or the Cooperative Extension Service.

In 1985, approximately 142,000 acres in Gilchrist County was used for crops and pasture *(4)*. This acreage includes improved pasture; field crops, mainly corn, peanuts, tobacco, and soybeans; specialty crops, such as watermelons, sweet corn, and field peas; and a few acres of grapes and pecans.

The potential of the soils in Gilchrist County for increased food production is fair. About 10,000 acres of potentially good cropland is now used as woodland and about 7,000 acres as pasture. These areas could be used as cropland if measures that control soil blowing on sandy soils and measures that control a fluctuating water table were applied. In addition to the reserve capacity represented by these areas, food production could be considerably increased by applying the latest technology to all cropland in the county. The acreage of crops, pasture, and woodland has gradually decreased as more land is used for urban development.

Water erosion is a problem on about three-fourths of the cropland and pasture in Gilchrist County. If the slope is more than 2 percent, erosion is a hazard, especially in areas of the well drained and moderately well drained Blanton, Bonneau, Otela, Shadeville, and Wadley soils and the somewhat poorly drained Albany and Ridgewood soils.

Loss of the surface layer through erosion is damaging for two reasons. First, productivity is reduced as the surface layer is lost and part of the subsoil is incorporated into the plow layer. Second, soil erosion on farmland results in the sedimentation of streams. Control of erosion minimizes this pollution and improves

the quality of water for municipal use, for recreational use, and for fish and wildlife.

Erosion-control practices help to maintain a protective cover, reduce the runoff rate, and increase the rate of water infiltration. A cropping system that keeps a vegetative cover on the surface for extended periods can keep soil losses to amounts that do not reduce the productive capacity of the soils. In sloping areas on livestock farms, which require pasture and hay, including grasses and legumes in the cropping system not only helps to control erosion but also provides nitrogen and improves tilth for the following crop. No-till farming is effective in controlling erosion in sloping areas used for corn or soybeans.

Most of the soils in the survey area have slopes that are so short and irregular that farming on the contour or terracing is not practical. Field stripcropping can help to control erosion on these soils. Diversions reduce the length of slopes and thus help to control runoff and erosion. They are most practical on deep, well drained soils that have regular slopes. Sod waterways can help to control runoff and erosion on most of the soils in the survey area.

Soil blowing is damaging for several reasons. It reduces soil fertility by removing the finer soil particles and organic matter; damages or destroys crops by sandblasting; spreads diseases, insects, and weed seeds; and creates health hazards and cleanliness problems. Reducing the hazard of soil blowing minimizes duststorms and improves the quality of the air.

Soil blowing is a major hazard on the sandy soils in the survey area. Strong winds can damage the soils and tender crops in a few hours in open, unprotected areas where the soils are dry and the surface is bare. Maintaining a vegetative cover and surface mulch reduces the hazard of soil blowing.

Field windbreaks of adapted trees and shrubs, such as laurelcherry, sand pine, slash pine, southern redcedar, and Japanese privet, and strip crops of small grain are effective in controlling soil blowing and crop damage. Field windbreaks and strip crops are narrow plantings made at right angles to the prevailing wind. They reduce the erodibility of the soil and the susceptibility of the crop to damage from sandblasting.

Environmental plantings help to beautify and screen houses and other buildings and to abate noise. The plants, mostly evergreen shrubs and trees, are closely spaced. To ensure plant survival, a healthy planting stock of suitable species should be planted properly on a well prepared site and maintained in good condition. Irrigation may be needed.

Additional information about planning windbreaks and screens and planting and caring for trees and shrubs can be obtained from the local offices of the Soil Conservation Service or the Cooperative Extension Service or from a commercial nursery. Information about erosion-control measures for each kind of soil is available in a handbook on erosion control in Florida, which is available at the local office of the Soil Conservation Service.

Soil drainage is a major management concern on about 30 percent of the acreage used for crops and pasture in the county. Some soils are naturally so wet that production of the crops commonly grown in the county is generally not practical. Examples are the poorly drained Leon, Pottsburg, and Sapelo soils and the very poorly drained Dorovan, Pamlico, and Surrency soils. These soils make up about 42,000 acres.

Unless a drainage system is installed, the wetness in the root zone of some of the somewhat poorly drained soils can cause damage to most crops during most years. Examples are Albany, Hurricane, and Ridgewood soils, which make up about 29,000 acres of the survey area.

In some undrained areas of the poorly drained Pottsburg, Leon, and Sapelo soils, wetness can cause damage to pasture plants. These soils also have a low available water capacity and are droughty during dry periods. They require subsurface irrigation for adequate forage production.

The very poorly drained Dorovan, Pamlico, Surrency, and Wesconnett soils are very wet during rainy periods and have water standing on the surface in most areas. The production of good-quality pasture on these soils is not possible without artificial drainage. A combination of surface drains and irrigation is needed for intensive forage production on these soils.

Information about drainage and irrigation for each kind of soil in the county is available at the local office of the Soil Conservation Service.

Soil fertility is naturally low in most of the soils in the survey area. Most of the soils have a sandy surface layer and are light colored. Many of the soils have a loamy subsoil. Examples are the Albany, Blanton, Bonneau, Eunola, and Wadley soils. Otela and Shadeville soils have an acid surface layer and are underlain by calcareous limestone that is mildly alkaline or moderately alkaline. Most of the soils have a surface layer that is strongly acid or very strongly acid and require applications of ground limestone to sufficiently raise the pH level for good crop growth. Levels of nitrogen, potassium, and available phosphorus are naturally low in most of these soils. Additions of lime and fertilizer should be based on the results of soil tests, the needs of the crop, and the expected level of

yields. The Cooperative Extension Service can help in determining the kinds and amounts of fertilizer and lime to be applied.

Soil tilth is an important factor affecting the germination of seeds and the infiltration of water into the soil. Soils with good tilth have a greater moisture- and nutrient-holding capacity than other soils and provide a good seedbed.

Most of the soils in the survey area have a sandy surface layer that is light in color and low to moderate in content of organic matter. Exceptions are Dorovan, Pamlico, and Wesconnett soils. These are organic soils or have an organic surface layer. The structure of the surface layer of most soils in the survey area is weak. When soils that are dry and low in content of organic matter receive intense rainfall, the colloidal matter cements and forms a slight crust, particularly if the soils have a plowpan. The crust is slightly hard when dry, and it is slightly impervious to water. It reduces the rate of water infiltration and increases the runoff rate. Regular additions of crop residue, manure, and other organic material improve soil structure and minimize crusting.

Fall plowing generally is not advisable. If sloping soils, which make up about one-fourth of the cropland in the survey area, are plowed in the fall, they are subject to damaging erosion. Gullies caused by erosion are common on unprotected soils. About three-fourths of the cropland in the county is sandy and is subject to soil blowing. Tons of soil are lost each year as a result of soil blowing during the spring plowing season.

The field crops grown in the county include corn, soybeans, peanuts, and tobacco. The acreage of grain sorghum and sugarcane could be increased if economic conditions were favorable. Rye and wheat are common close-growing crops. Oats and triticale also can be grown.

The major specialty crops grown commercially in the survey area are watermelons. Other specialty crops include squash, blueberries, grapes, pecans, and field peas. If economic conditions are favorable, the acreage of blueberries, apples, pears, strawberries, grapes, blackberries, nursery sod, cabbage, turnips, collards, and mustard greens can be increased.

Deep soils that have good natural drainage are especially well suited to many vegetables and small fruits. If irrigated, about 24,000 acres of Bonneau, Eunola, Otela, Shadeville, and Wadley soils that have slopes of less than 8 percent are very well suited to vegetables and small fruits. If adequately drained, about 28,000 acres of Albany, Hurricane, and Ridgewood soils are well suited to vegetables and small fruits.

Information about growing specialty crops can be obtained from the local offices of the Cooperative Extension Service and the Soil Conservation Service.

Pasture is grazed by beef and dairy cattle. Bahiagrass and improved bermudagrass are the major pasture plants grown in the county. Seeds can be harvested from bahiagrass for improved pasture plantings as well as for commercial purposes. Many cattlemen seed small grain on cropland and overseed rye in pastures in the fall for winter and spring grazing. In bermudagrass pastures, excess grass is harvested during the summer as hay for winter feed. Also, hay for winter feed is made from peanut vines after harvest.

The well drained and moderately well drained Alpin, Blanton, Bonneau, Otela, Shadeville, and Wadley soils are well suited to bahiagrass and improved bermudagrass. If good management is applied, hairy indigo and alyce clover can be grown during the summer and fall.

The somewhat poorly drained Albany and Hurricane soils are well suited to bahiagrass and to improved bermudagrass if grown with legumes, such as sweet clover, and if adequate amounts of lime and fertilizer are applied.

If drained, Hurricane, Leon, Mandarin, Pottsburg, and Sapelo soils are well suited to bahiagrass and limpograss. Subsurface irrigation increases the length of the growing season and total forage production. If adequate amounts of lime and fertilizer are applied, the soils are well suited to legumes, such as white clover.

In many parts of the county, pastures are greatly depleted by continuous excessive grazing. Pasture yields can be increased by applying proper grazing methods, by irrigating, by applying fertilizer and lime, and by growing legumes.

Differences in the amount and kind of pasture yields are closely related to the kind of soil. Pasture management is based on the interrelationship of soils, plants, lime, fertilizer, and moisture. Information about pasture management can be obtained at the local offices of the Cooperative Extension Service and the Soil Conservation Service.

Yields Per Acre

The average yields per acre that can be expected of the principal crops under a high level of management are shown in table 5. In any given year, yields may be higher or lower than those indicated in the table because of variations in rainfall and other climatic factors. The land capability classification of each map unit also is shown in the table.

The yields are based mainly on the experience and records of farmers, conservationists, and extension agents. Available yield data from nearby counties and results of field trials and demonstrations are also considered.

The management needed to obtain the indicated yields of the various crops depends on the kind of soil and the crop. Management can include drainage, erosion control, and protection from flooding; the proper planting and seeding rates; suitable high-yielding crop varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; favorable soil reaction and optimum levels of nitrogen, phosphorus, potassium, and trace elements for each crop; effective use of crop residue, barnyard manure, and green manure crops; and harvesting that ensures the smallest possible loss.

The estimated yields reflect the productive capacity of each soil for each of the principal crops. Yields are likely to increase as new production technology is developed. The productivity of a given soil compared with that of other soils, however, is not likely to change.

Crops other than those shown in table 5 are grown in the survey area, but estimated yields are not listed because the acreage of such crops is small. The local offices of the Soil Conservation Service and the Cooperative Extension Service can provide information about the management and productivity of the soils for those crops.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects. Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland or for engineering purposes.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have slight limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main hazard is the risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c,* used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

There are no subclasses in class I because the soils of this class have few limitations. The soils of class V are subject to little or no erosion, but they have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation. Class V contains only the subclasses indicated by *w, s,* or *c.*

The capability classification of each map unit is given in the section "Detailed Soil Map Units" and in the yields table.

Woodland Management and Productivity

Approximately 31,000 acres in Gilchrist County, or nearly 14 percent of the land area, is used as woodland *(4)*. The acreage of commercial woodland in the county is decreasing because of the conversion of woodland to urban and agricultural uses.

The soils and climate of Gilchrist County are suitable for timber production. Most of the woodland is in areas of Hurricane, Leon, Pottsburg, Ridgewood (fig. 5), and Sapelo soils. Leon soils produce most of the timber in the flatwoods.

Most of the woodland is managed for needle-leaved trees, including slash pine, longleaf pine, loblolly pine, and southern baldcypress. Common broad-leaved trees include water oak, laurel oak, live oak, sweetgum, and blackgum.

Maintaining the habitat for deer, quail, and the red-

Figure 5.—A plantation of slash pine in an area of Ridgewood fine sand, 0 to 5 percent slopes.

cockaded woodpecker is a major objective in managing woodland. Most of the woodland is leased for cattle grazing. Grazing plans are coordinated with timber production. New forest stands are regenerated naturally or are planted to genetically improved seedlings.

Most areas of woodland in the county are corporate owned and managed. They are primarily areas of intensive pulpwood production. Slash pine is the dominant tree. Timber management consists of pulpwood rotations followed by clearcutting, intensive site preparation, and tree planting.

Small, privately owned forest stands are in scattered areas throughout the county. Many of the stands are plantations that provide wood for the pulpwood and sawlog markets. Slash pine is the dominant tree in these plantations. Trees in the natural stands include loblolly pine, longleaf pine, baldcypress, sweetgum, blackgum, water oak, laurel oak, sweetbay, redbay, and loblollybay gordonia.

Markets for forest products are plentiful in Gilchrist County. The major market is for pulpwood. The demand is increasing for trees large enough for the chipping-saw and sawlog mills. A wide variety of wood-processing mills within 70 miles of Trenton creates a great demand for wood.

Soils vary in their ability to produce trees. Available water capacity and depth of the root zone have major affects on tree growth. Fertility and texture also influence tree growth. Elevation, aspect, and climate determine the kinds of trees that can grow on a site.

This soil survey can be used by woodland managers planning ways to increase the productivity of forest land. Some soils respond better to applications of fertilizer than others, some are more susceptible to

landslides and erosion after roads are built and timber is harvested, and some require special reforestation efforts. In the section "Detailed Soil Map Units," the description of each map unit in the county suitable for timber includes information about productivity, limitations in harvesting timber, and management concerns in producing timber. In addition, the common forest understory plants are listed. Table 6 summarizes this forestry information and rates the soils for a number of factors to be considered in management. *Slight, moderate*, and *severe* are used to indicate the degree of the major soil limitations to be considered in forest management.

Table 6 lists the *ordination symbol* for each soil. The first part of the ordination symbol, a number, indicates the potential productivity of a soil for the indicator species in cubic meters per hectare. The larger the number, the greater the potential productivity. Potential productivity is based on the site index and the point where mean annual increment is the greatest.

The second part of the symbol, a letter, indicates the major kind of soil limitation affecting use and management. The letter *W* indicates a soil in which excessive water, either seasonal or year-round, causes a significant limitation. The letter *S* indicates a dry, sandy soil. The letter *A* indicates a soil having no significant limitations that affect forest use and management. If a soil has more than one limitation, the priority is W and then S.

Ratings of *equipment limitation* indicate limits on the use of the forest management equipment, year-round or seasonal, because of such soil characteristics as slope, wetness, stoniness, or susceptibility of the surface layer to compaction. As slope gradient and length increase, it becomes more difficult to use wheeled equipment. The rating is *slight* if equipment use is restricted by wetness for less than 2 months and if special equipment is not needed. The rating is *moderate* if wetness restricts equipment use from 2 to 6 months per year, if stoniness restricts the use of ground-based equipment, or if special equipment is needed to prevent or minimize compaction. The rating is *severe* if wetness restricts equipment use for more than 6 months per year, if stoniness restricts the use of ground-based equipment, or if special equipment is needed to prevent or minimize compaction. Ratings of *moderate* or *severe* indicate a need to choose the most suitable equipment and to carefully plan the timing of harvesting and other management activities.

Ratings of *seedling mortality* refer to the probability of the death of naturally occurring or properly planted seedlings of good stock in periods of normal rainfall, as influenced by kinds of soil or topographic features. Seedling mortality is caused primarily by too much water or too little water. The factors used in rating a soil for seedling mortality are texture of the surface layer, depth to a seasonal high water table and the length of the period when the water table is high, rock fragments in the surface layer, rooting depth, and the aspect of the slope. The mortality rate generally is highest on soils that have a sandy or clayey surface layer. The risk is *slight* if, after site preparation, expected mortality is less than 25 percent; *moderate* if expected mortality is between 25 and 50 percent; and *severe* if expected mortality exceeds 50 percent. Ratings of *moderate* or *severe* indicate that it may be necessary to use containerized or larger than usual planting stock or to make special site preparations, such as bedding, furrowing, installing a surface drainage system, and providing artificial shade for seedlings. Reinforcement planting is often needed if the risk is moderate or severe.

Ratings of *plant competition* indicate the likelihood of the growth or invasion of undesirable plants. Plant competition is more severe on the more productive soils, on poorly drained soils, and on soils that have a restricted root zone that holds moisture. The risk is *slight* if competition from undesirable plants hinders natural or artificial reforestation but does not necessitate intensive site preparation and maintenance. The risk is *moderate* if competition from undesirable plants hinders natural or artificial reforestation to the extent that intensive site preparation and maintenance are needed. The risk is *severe* if competition from undesirable plants prevents adequate natural or artificial reforestation unless the site is intensely prepared and maintained. A *moderate* or *severe* rating indicates the need for site preparation to ensure the development of an adequately stocked stand. Managers must plan site preparation measures to ensure reforestation without delays.

The *potential productivity* of *common trees* on a soil is expressed as a *site index* and a *volume* number. Common trees are listed in the order of their observed general occurrence. Generally, only two or three tree species dominate. The first tree listed for each soil is the indicator species for that soil. An indicator species is a tree that is common in the area and that is generally the most productive on a given soil.

The *site index* is determined by taking height measurements and determining the age of selected trees within stands of a given species. This index is the average height, in feet, that the trees attain in a specified number of years. This index applies to fully stocked, even-aged, unmanaged stands. The site index values given in table 6 are based on standard procedures and techniques *(16, 19, 23)*.

The *volume* is the yield likely to be produced by the

most important trees, expressed in cubic feet per acre per year, calculated at the age of culmination of mean annual increment.

Trees to plant are those that are used for reforestation or, under suitable conditions, natural regeneration. They are suited to the soils and can produce a small commercial wood crop. The desired product, topographic position (such as a low, wet area), and personal preference are three factors among many that can influence the choice of trees for use in reforestation.

Grazeable Woodland

R. Gregory Hendricks, range conservationist, Soil Conservation Service, helped prepare this section.

Gilchrist County has approximately 31,000 acres of woodland, much of which is moderately suited or well suited to livestock grazing. Most of the woodland that has potential for livestock grazing is within a region of the county known as the Waccasassa Flats. This region is interspersed with upland ridges, flatwoods, and forested wetlands. It can be used for low-cost, low-maintenance forage production.

Grazeable woodland has an understory of native grasses, legumes, forbs, and shrubs. The understory is an integral part of the forest plant community. The native plants can be grazed without significantly impairing forest values. Grazing is compatible with timber management if it is controlled or managed in such a manner that timber and forage resources are maintained or enhanced. The native forage in wooded areas is readily available to livestock and is an economic resource. Integrating woodland and grazing management offers opportunities for landowners to obtain income from the woodland during the life of the timber stand.

The three major grazeable woodland sites in Gilchrist County are the North Florida Flatwoods, the Longleaf Pine-Turkey Oak Hills, and the Upland Hardwood Hammocks. The North Florida Flatwoods are well suited to grazing. The native forage plants on this site include creeping bluestem, chalky bluestem, indiangrass, blue maidencane, and various panicum grasses. The Longleaf Pine-Turkey Oak Hills are moderately suited to grazing. The native forage plants on this site include beaked panicum, indiangrass, creeping bluestem, and other bluestems. The Upland Hardwood Hammocks are poorly suited to grazing. The native forage plants on this site include switchgrass, longleaf uniola, and various bluestem grasses.

Forage production on grazeable woodland varies, depending on site conditions. The amount of shade cast by the canopy, the accumulation of fallen needles, the time and intensity of grazing, the method of site preparation for tree planting, and the number, size, and spacing of planted seedlings affect the potential grazing capacity. On the soils of the North Florida Flatwoods, such as Albany, Hurricane, Leon, and Pottsburg soils, stocking rates typically range from 10 to 30 acres per animal unit. On the soils of the Longleaf Pine-Turkey Oak Hills, such as Kershaw, Ortega, and Penney soils, stocking rates typically range from 15 to 40 acres per animal unit. On the soils of the Upland Hardwood Hammocks, such as Blanton, Bonneau, and Ridgewood soils, stocking rates typically range from 15 to 60 acres per animal unit.

Table 7 shows, for each soil used as grazeable woodland in the county, the grazeable woodland site name, the average annual forage production of a site in excellent condition, and the desirable native forage.

Newly planted pine stands can be grazed during the second growing season following planting. Maximum forage yields can be expected on sites in excellent condition through the 12th year of the pine stand. Annual forage production decreases as the forest canopy begins to close in areas where traditional planting methods are used. Innovative pine spacing techniques, such as double rows of trees separated by 30- to 60-foot spaces managed for grazing, have allowed landowners to achieve an acceptable level of pulp production while maintaining their native grazing resources throughout the rotation of the timber.

Recreation

Natural springs and the Santa Fe and Suwannee Rivers provide many opportunities for recreational activities in Gilchrist County, including swimming, boating, and fishing. Opportunities for hunting are available on the Waccasassa Flats.

Ginnie Spring Park is the most popular recreational site in the county. The spring that surfaces within the park and flows southward attracts thousands of swimmers, divers, canoers, and other visitors each year. Hart Spring County Park offers opportunities for water activities along the Suwannee River. Camping, hiking, picnicking, and observing wildlife are other popular activities.

The county's rivers provide opportunities for canoeing, kayaking, diving, and sightseeing. The Great Suwannee River Canoeing and Kayaking Competition is held on a part of the Suwannee River that borders Gilchrist County.

Areas in or near Trenton provide opportunities for baseball, tennis, racquetball, basketball, and other games. Civic clubs and church groups sponsor many of these activities.

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewer lines. The capacity of the soil to absorb septic tank effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreational uses by the duration and intensity of flooding and the season when flooding occurs. In planning recreational facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations, if any, are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations may be offset by soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for septic tank absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

John F. Vance, Jr., biologist, Soil Conservation Service, helped prepare this section.

Gilchrist County has extensive areas of good wildlife habitat. The large areas of flatwoods and swamps and the areas of hardwoods along the rivers provide better habitat than other areas in the county. Important areas include the 33,000-acre Waccasassa Flats and the areas along the Suwannee and Santa Fe Rivers.

The main game species in the county include white-tailed deer, squirrels, turkey, bobwhite quail, mourning dove, feral hogs, and waterfowl. Nongame species include raccoon, rabbit, armadillo, opossum, skunks, bobcat, gray fox, red fox, otter, and a variety of songbirds, wading birds, woodpeckers, predatory birds, reptiles, and amphibians.

The headwaters of the Waccasassa River are in Gilchrist County, and the Santa Fe and Suwannee Rivers form the northern and western boundaries. There are 10 lakes in the county. The largest of these are Four Mile Lake and Shirley Lake, each of which is about 100 acres in size. The lakes, the rivers, and the larger tributaries of the rivers provide good opportunities for fishing. Game and nongame fish species include largemouth bass, channel catfish, bullhead catfish, bluegill, redear, spotted sunfish, warmouth, black crappie, chain pickerel, gar, bowfin, and suckers.

Several endangered and threatened species inhabit Gilchrist County. Examples are the rare red-cockaded woodpecker and the more common southeastern kestrel. A detailed list of these species and information

about their range and habitat are available at the local office of the Soil Conservation Service.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, soybeans, wheat, browntop millet, and grain sorghum.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also considerations. Examples of grasses and legumes are bahiagrass, lovegrass, Florida beggarweed, clover, and sesbania.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggarweed, partridge pea, and bristlegrass.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, palmetto, cherry, sweetgum, wild grape, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are firethorn, wild plum, and American beautyberry.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, fir, cedar, and juniper.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, wild millet, wildrice, maidencane, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, waterfowl feeding areas, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. Wildlife attracted to these areas include bobwhite quail, dove, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of

deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include wild turkey, woodcock, thrushes, woodpeckers, squirrels, gray fox, raccoon, deer, and bobcat.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, herons, shore birds, otter, mink, and alligator.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations should be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, depth to bedrock, hardness of bedrock within 5 or 6 feet of the surface, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to evaluate the potential of areas for residential, commercial, industrial, and recreation uses; make preliminary estimates of construction conditions; evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; plan detailed onsite investigations of soils and geology; locate potential sources of gravel, sand, earthfill, and topsoil; plan drainage systems, irrigation systems, ponds, and other structures for soil and water conservation; and predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey, can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the "Glossary."

Building Site Development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations, if any, are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by the depth to bedrock, a cemented pan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and depth to the water table.

Dwellings and *small commercial buildings* are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 or 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material; a base of gravel, crushed rock, or stabilized soil material; and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a cemented pan, the available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 11 shows the degree and kind of soil limitations that affect septic tank absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations, if any, are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 11 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Septic tank absorption fields are areas in which effluent from a septic tank is distributed into the soil through subsurface tiles or perforated pipe. Only that part of the soil between depths of 24 and 72 inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to bedrock or to a cemented pan, and flooding affect absorption of the effluent. Large stones and bedrock or a cemented pan interfere with installation.

Unsatisfactory performance of septic tank absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 11 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a cemented pan, flooding, large stones, and content of organic matter.

Excessive seepage resulting from rapid permeability

in the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and cemented pans can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground-water pollution. Ease of excavation and revegetation should be considered.

The ratings in table 11 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a cemented pan, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over bedrock, a cemented pan, or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help to determine the suitability of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, a low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have a moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and depth to the water table is less than 1 foot. These soils may have layers of suitable material, but the material is less than 3 feet thick.

Sand and *gravel* are natural aggregates suitable for commercial use with a minimum of processing. They are used in many kinds of construction. Specifications

for each use vary widely. In table 12, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal high water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and releases a variety of plant nutrients as it decomposes.

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations, if any, are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, terraces and diversions, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed

only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. Depth to bedrock and the content of large stones affect the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to bedrock, to a cemented pan, or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to bedrock or to a cemented pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a cemented pan. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Terraces and diversions are embankments or a combination of channels and ridges constructed across a slope to control erosion and conserve moisture by intercepting runoff. Slope, wetness, large stones, and depth to bedrock or to a cemented pan affect the construction of terraces and diversions. A restricted rooting depth, a severe hazard of soil blowing or water erosion, an excessively coarse texture, and restricted permeability adversely affect maintenance.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to bedrock or to a cemented pan affect the construction of grassed waterways. A hazard of soil blowing, a low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics. These results are reported in table 20.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classification, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the "Glossary."

Classification of the soils is determined according to the Unified soil classification system *(2)* and the system adopted by the American Association of State Highway and Transportation Officials *(1)*.

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as PT. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest. The AASHTO classification for soils tested, with group index numbers in parentheses, is given in table 20.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates

determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index generally are rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence the shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at ⅓ bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Shrink-swell potential is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change

of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Wind erodibility groups are made up of soils that have similar properties affecting their resistance to soil blowing in cultivated areas. The groups indicate the susceptibility to soil blowing. Soils are grouped according to the following distinctions:

1. Coarse sands, sands, fine sands, and very fine sands. These soils are extremely erodible, and vegetation is difficult to establish.

2. Loamy coarse sands, loamy sands, loamy fine sands, loamy very fine sands, and sapric soil material. These soils are very highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

3. Coarse sandy loams, sandy loams, fine sandy loams, and very fine sandy loams. These soils are highly erodible. Crops can be grown if intensive measures to control soil blowing are used.

4L. Calcareous loams, silt loams, clay loams, and silty clay loams. These soils are erodible. Crops can be grown if intensive measures to control soil blowing are used.

4. Clays, silty clays, noncalcareous clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control soil blowing are used.

5. Noncalcareous loams and silt loams that are less than 20 percent clay and sandy clay loams, sandy clays, and hemic soil material. These soils are slightly erodible. Crops can be grown if measures to control soil blowing are used.

6. Noncalcareous loams and silt loams that are more than 20 percent clay and noncalcareous clay loams that are less than 35 percent clay. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.

7. Silts, noncalcareous silty clay loams that are less than 35 percent clay, and fibric soil material. These soils are very slightly erodible. Crops can be grown if ordinary measures to control soil blowing are used.

8. Soils that are not subject to soil blowing because of coarse fragments on the surface or because of surface wetness.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 15, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter in a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the infiltration of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

If a soil is assigned to two hydrologic groups in table

16, the first letter is for drained areas and the second is for undrained areas.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 16 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

Frequency, duration, and probable period of occurrence are estimated. Frequency generally is expressed as *none, rare, occasional,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (the chance of flooding is nearly 0 percent to 5 percent in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (the chance of flooding is 5 to 50 percent in any year). *Frequent* means that flooding occurs often under normal weather conditions (the chance of flooding is more than 50 percent in any year). Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely, thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons characteristic of soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely, grayish colors or mottles in the soil. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table, that is, *perched* or *apparent;* and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in table 16.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Two numbers in the column showing depth to the water table indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that it is within a depth of 6 feet for less than a month.

Subsidence is the settlement of organic soils or of saturated mineral soils of very low density. Subsidence results from either desiccation and shrinkage or oxidation of organic material, or both, following drainage. Subsidence takes place gradually, usually over a period of several years. Table 16 shows the expected initial subsidence, which usually is a result of drainage, and total subsidence, which usually is a result of oxidation.

Not shown in the table is subsidence caused by an imposed surface load or by the withdrawal of ground water throughout an extensive area as a result of lowering the water table.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Physical, Chemical, and Mineralogical Analyses of Selected Soils

Dr. Victor W. Carlisle, professor, University of Florida, Soil Science Department, Agricultural Experiment Station, prepared this section.

Parameters for physical, chemical, and mineralogical properties of representative pedons sampled in Gilchrist County are presented in tables 17, 18, and 19. The analyses were conducted and coordinated by the Soil Characterization Laboratory at the University of Florida. Detailed descriptions of the analyzed soils are given in the section "Soil Series and Their Morphology." Laboratory data and profile information for additional soils in Gilchrist County and for soils in other counties in Florida are on file at the University of Florida, Soil Science Department.

Typical pedons were sampled from pits at carefully selected locations. Samples were air dried, crushed, and sieved through a 2-millimeter screen. Most analytical methods used are outlined in a soil survey investigations report *(21)*.

Particle-size distribution was determined using a modified pipette method with sodium hexametaphosphate dispersion. Hydraulic conductivity and bulk density were determined on undisturbed soil cores. Water retention parameters were obtained from duplicate undisturbed soil cores placed in tempe pressure cells. Weight percentages of water retained at 100-centimeters water (1/10 bar) and 345-centimeters water (1/3 bar) were calculated from volumetric water percentages divided by bulk density. Samples were ovendried and ground to pass a 2-millimeter sieve, and the 15-bar water retention was determined. Organic carbon was determined by a modification of the Walkley-Black wet combustion method.

Data on extractable bases were obtained by leaching soils with normal ammonium acetate buffered at pH 7.0. Sodium and potassium in the extract were determined by flame emission. Calcium and magnesium were determined by atomic absorption spectrophotometry. Extractable acidity was determined by the barium chloride-triethanolamine method at pH 8.2. Cation-exchange capacity was calculated by summation of extractable bases and extractable acidity. Base saturation is the ratio of extractable bases to cation-exchange capacity expressed as a percent. The pH measurements were made with a glass electrode using a soil-water ratio of 1:1, a 0.01 molar calcium chloride solution in a 1:2 soil-solution ratio, and a normal potassium-chloride solution in a 1:1 soil-solution ratio.

Electrical conductivity determinations were made with a conductivity bridge in 1:1 soil-water mixtures. Iron and aluminum extractable in sodium dithionite-citrate were determined by atomic absorption spectrophotometry. Aluminum, carbon, and iron were extracted from probable spodic horizons with 0.1 molar sodium pyrophosphate. Determinations of aluminum and iron were made by atomic absorption, and determinations of extracted carbon were made by the Walkley-Black wet combustion method.

Mineralogy of the clay fraction less than 2 microns was ascertained by x-ray diffraction. Peak heights at 18-angstrom, 14-angstrom, 7.2-angstrom, and 4.31-angstrom positions represent montmorillonite, interstratified expandable vermiculite or 14-angstrom intergrades, kaolinite, and quartz, respectively. Peaks were measured, added, and normalized to give the percentage of soil minerals identified in the x-ray diffractograms. These percentage values do not indicate absolute determined quantities of soil minerals but do imply a relative distribution of minerals in a particular mineral suite. Absolute percentages would require additional knowledge of particle size, crystallinity, unit structure substitution, and matrix problems.

The soils sampled for laboratory analyses in Gilchrist County are inherently very sandy (see table 17). Many pedons, however, have an argillic horizon in the lower part of the solum. All soils have two or more horizons in which the total sand content exceeds 90 percent. Kershaw, Leon, Ortega, Penney, and Ridgewood soils contain more than 95 percent total sand to a depth of 2 meters or more. Hurricane, Mandarin, and Resota soils contain more than 90 percent total sand to a depth of 2 meters or more. The content of clay in these soils rarely exceeds 2 percent. The content of clay in the deeper argillic horizons in Albany, Blanton, Eunola, Garcon, Meggett, Otela, Sapelo, and Shadeville soils ranges from 15.1 to 38.6 percent. The content of silt ranges from 0.1 percent in Kershaw fine sand to 19.9 percent in Meggett soils. All horizons sampled in the Blanton and Meggett soils contain more than 5 percent silt.

Fine sand dominates the sand fractions of all soils in the survey area. All horizons in Albany, Eunola, Kershaw, Leon, Mandarin, Penney, Resota, and Ridgewood soils contain more than 50 percent fine sand. The other soils sampled have one or more horizons in which the content of fine sand is more than 50 percent. Generally, medium sand is the second most common sand fraction, but higher amounts of very fine sand, as compared to medium sand, occur in Blanton, Garcon, Resota, and Shadeville soils. In the other soils the content of very fine sand is generally less than 10 percent. The content of coarse sand is less than 2 percent in Albany, Eunola, Garcon, Kershaw, Mandarin, Ortega, Ridgewood, and Sapelo soils and ranges from 0.4 to 6.2 percent in the other soils. Very coarse sand is not detectable in Albany, Hurricane, Kershaw, Leon,

Mandarin, Ortega, and Ridgewood soils. In most of the other soils, the content of very coarse sand is less than 0.5 percent.

The sandy soils in this county rapidly become very droughty during periods of low precipitation, and they are rapidly saturated during periods of heavy rainfall. Poorly drained soils, such as Leon and Meggett soils, may remain saturated with ground water near the surface for extended periods.

Hydraulic conductivity values exceed 22 centimeters per hour throughout Kershaw, Ortega, and Penney soils. Similarly, values are 22 centimeters per hour or more to a depth of slightly more than 1 meter in Albany, Hurricane, and Resota soils. Values in the argillic horizon of Albany, Eunola, Garcon, Otela, Sapelo, and Shadeville soils rarely exceed 2.0 centimeters per hour. Hydraulic conductivity is not detectable in the argillic horizon in Meggett fine sand. Hydraulic conductivity values in the Bh1 horizon of Leon fine sand are low. Those in the Bh horizon of Hurricane, Mandarin, and Sapelo soils are higher than those in most spodic horizons in the soils of Florida.

The amount of water available to plants can be estimated from data on bulk density and water content. The amount is very low in excessively sandy soils, such as Hurricane, Kershaw, Ortega, Penney, and Ridgewood soils. It is much higher in soils that have higher amounts of fine textured material, such as Meggett soils.

Most soils in Gilchrist County contain low amounts of extractable bases (see table 18). With the exception of Meggett fine sand, the soils have one or more horizons in which extractable bases are less than 1 milliequivalent per 100 grams. Meggett fine sand contains the highest amount of extractable bases, ranging from 1.58 to 43.27 milliequivalents per 100 grams. Albany, Garcon, Hurricane, Kershaw, Leon, Mandarin, Ortega, Penney, Resota, and Ridgewood soils contain less than 1 milliequivalent per 100 grams throughout. One or more horizons in Blanton, Eunola, Otela, Sapelo, and Shadeville soils exceed 1 milliequivalent per 100 grams. The relatively mild, humid climate of Gilchrist County results in a rapid depletion of basic cations, including calcium, magnesium, potassium, and sodium, from the surface layer through leaching.

Calcium is the dominant base in all of the soils. Only the Bt horizon in Blanton and Eunola soils contains slightly more magnesium than calcium. Higher amounts of calcium in the lower horizons of Meggett and Shadeville soils reflect a close proximity to limestone. The content of extractable calcium throughout Albany, Garcon, Hurricane, Kershaw, Leon, Mandarin, Ortega, Penney, Resota, and Ridgewood soils is 0.60 or less milliequivalent per 100 grams.

The content of extractable magnesium exceeds 1 milliequivalent per 100 grams in only one horizon of Shadeville fine sand and two horizons of Eunola fine sand. The combined amounts of extractable calcium and magnesium rarely exceed 1 milliequivalent per 100 grams in the surface layer. The content of sodium generally is less than 0.10 milliequivalent per 100 grams. In one or more horizons in Meggett, Sapelo, and Shadeville soils, however, it slightly exceeds this amount.

All of the soils have horizons in which the content of extractable potassium is 0.05 milliequivalent or less per 100 grams. Albany, Blanton, Garcon, Hurricane, Kershaw, Leon, Mandarin, Ortega, Otela, Penney, Resota, and Ridgewood soils have no detectable potassium in one or more horizons.

Values for cation-exchange capacity, an indicator of the nutrient-holding capacity, exceed 10 milliequivalents per 100 grams in the surface layer of Meggett and Sapelo soils. An enhanced cation-exchange capacity parallels a higher content of clay in the lower horizons of Albany, Eunola, Garcon, Blanton, Meggett, Otela, Sapelo, and Shadeville soils. Soils that have a low cation-exchange capacity in the surface layer, such as Mandarin and Penney soils, require only small amounts of lime or sulfur to significantly alter their base status and reaction. An inherently low level of fertility generally is associated with a low content of extractable bases and a low cation-exchange capacity, and a higher level of fertility is associated with a high content of extractable bases, high base saturation, and a high cation-exchange capacity.

The content of organic carbon is less than 1 percent in all horizons of Eunola, Garcon, Hurricane, Kershaw, Meggett, Ortega, Otela, Penney, Resota, Ridgewood, and Shadeville soils. The surface layer of Albany and Blanton soils contains 1.00 and 1.02 percent organic carbon, respectively. The other horizons in these soils contain less than 0.50 percent organic carbon. Only Leon and Mandarin soils have horizons with more than 2 percent organic carbon. These values are recorded for the Bh horizon. In most soils the content of organic carbon decreases rapidly as depth increases. The content increases, however, in the Bh horizon of Hurricane, Leon, Mandarin, and Sapelo soils. Because the organic carbon in the surface layer is directly related to the nutrient- and water-holding capacities of sandy soils, management practices that conserve and maintain the amounts of organic carbon are highly desirable.

Electrical conductivity values are low in nearly all of

the soils, generally ranging from 0.02 to 0.05 millimhos per centimeter. Eunola fine sand is the exception. It has values ranging from 0.06 to 0.10 millimhos per centimeter. Slightly higher electrical conductivity values occur in one or two horizons in Meggett, Sapelo, and Shadeville soils. These data indicate that the content of soluble salts in the soils of Gilchrist County is insufficient to determinately affect the growth of salt-sensitive plants.

Soil reaction in water generally ranges from pH 4.0 to 5.5 in the soils of the county. Values beyond this range occur in the lower horizons of Meggett and Shadeville soils and in the surface layer of Eunola fine sand. Generally, reaction is approximately 0.2 to 0.5 pH units lower in calcium chloride and potassium chloride solutions than in water. The maximum availability of plant nutrients is generally attained when reaction is between pH 6.5 and 7.5. Maintaining reaction above pH 6.0, however, is not economically feasible in most agricultural areas in Florida.

The ratio of sodium pyrophosphate carbon and aluminum to clay in the Bh horizon of Hurricane, Leon, Mandarin, and Sapelo soils is sufficient to meet the chemical criteria established for spodic horizons. The ratio of pyrosphosphate extractable iron and aluminum to citrate-dithionite extractable iron and aluminum also is sufficient to meet these criteria. In the Bh horizon of these soils, the content of sodium pyrophosphate extractable iron ranges from 0.00 to 0.02 percent and the content of citrate-dithionite extractable iron ranges from 0.03 to 0.14 percent.

The content of citrate-dithionite extractable iron in the Bt horizon of Albany, Blanton, Eunola, Garcon, Meggett, Otela, and Shadeville soils ranges from 0.06 to 1.75 percent and is generally less than 0.75 percent. The content is much higher in the Bt horizon of Albany, Blanton, Eunola, Garcon, Meggett, and Otela soils than in the Bh horizon of Hurricane, Leon, Mandarin, and Sapelo soils. The amount of extractable iron and aluminum in the soils of Gilchrist County is not sufficient to determinately affect the availability of phosphorus.

Quartz is overwhelmingly dominant in the sand fraction in all of the soils. Varying amounts of heavy minerals occur in all horizons. The greatest concentrations are in the very fine sand fraction. No weatherable minerals are evident. Crystalline mineral components of the clay fraction are reported in table 19 for the major horizons of the sampled pedons. The clay mineral suite consists mainly of montmorillonite, a 14-angstrom intergrade, kaolinite, and quartz.

Montmorillonite occurs only in Garcon, Meggett, Resota, Sapelo, and Shadeville soils. The 14-angstrom intergrade mineral occurs in nearly all horizons of all the soils. Exceptions are the A horizon of Sapelo fine sand, the Bh horizon of Hurricane fine sand, and the Cg horizon of Eunola fine sand. Kaolinite occurs in nearly all horizons of all the soils. Exceptions are the A horizon of Sapelo fine sand and the Bh horizon of Hurricane fine sand. Quartz occurs in varying amounts throughout all the sampled pedons. The amounts of mica and gibbsite are insufficient for the assignment of numerical values.

Montmorillonite in the soils of Gilchrist County apparently was inherited from the sediments in which the soils formed. It is most abundant in poorly drained areas where the alkaline elements have not been leached by percolating rainwater. It may occur, however, in moderate amounts regardless of present drainage or chemical conditions. Montmorillonite is a major constituent of the clay minerals occurring in the Btg2 horizon of Sapelo fine sand and in all horizons of Meggett fine sand.

The 14-angstrom intergrade is a mineral of uncertain origin that is widespread in Florida soils. It tends to be most prevalent under moderately acidic, relatively well drained conditions, although it occurs in a wide variety of soil environments. This mineral is a major constitute of sand grain coatings in Hurricane, Kershaw, Ortega, Penney, and Ridgewood soils. The number of coatings, however, is not sufficient to meet the taxonomic criteria established for coated soil classes.

Kaolinite was most likely inherited from the parent material. It may also have formed through the weathering of other material. Kaolinite is relatively stable in the acidic environments that prevail throughout most of Gilchrist County. Weathering becomes less severe as depth increases. Therefore, the amount of kaolinite is commonly higher in the lower part of the solum. Clay-sized quartz is primarily the result of decrements in the silt fraction.

Clay mineralogy can have a significant impact on soil properties, particularly in soils that have a high content of clay. Soils that contain significant amounts of montmorillonite have a higher capacity for the retention of plant nutrients than soils that dominantly contain kaolinite, 14-angstrom intergrade minerals, and quartz. The large amount of montmormillonitic clay in Meggett soils is a problem affecting most types of construction because it results in a high shrink-swell potential.

Engineering Index Test Data

Table 20 shows engineering test data for several pedons sampled at carefully selected sites in the survey area. The pedons are representative of the series described in the section "Soil Series and Their Morphology." The soil samples were tested by the Florida Department of Transportation, Soils Laboratory,

Bureau of Materials and Research. The testing methods are those of the American Association of State Highway and Transportation Officials (AASHTO) or the American Society for Testing and Materials (ASTM). The results of these tests are useful in evaluating the soils for engineering purposes. The classifications given are based on data obtained by mechanical analysis and by tests to determine liquid limits and plastic limits.

The mechanical analyses were made by the combined sieve and hydrometer method. When this method is applied, the various grain-sized fractions are calculated on the basis of all the material in the soil sample, including that coarser than 2 millimeters in diameter. The results of this method should not be used in naming textural classes of soils.

Liquid limit and plasticity index indicate the effect of water on the strength and consistence of the soil material. As the moisture content of a dry, clayey soil is increased, the material changes from a dry state to a semisolid state and then to a plastic state. If the moisture content is further increased, the material changes from plastic to liquid. The plastic limit is the moisture content at which the soil material changes from a semisolid state to a plastic state, and liquid limit is the moisture content at which the soil material changes from a plastic state to a liquid state. The plasticity index is the numerical difference between the liquid limit and the plastic limit. It indicates the range of moisture content within which soil material is plastic. The data on liquid limit and plasticity index in table 20 are based on laboratory tests of soil samples.

Compaction, or moisture-density, data are important in earthwork. If soil material is compacted at a successively higher moisture content, assuming that the compactive effort remains constant, the density of the compacted material increases until the optimum moisture content is reached. After that, density decreases with an increase in moisture content. The highest dry density obtained in the compactive test is termed maximum dry density. As a rule, maximum strength of earthwork is obtained if the soil is compacted to the maximum dry density.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories *(22)*. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 21 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Eleven soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Entisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Psamment (*Psamm*, meaning sandy horizons, plus *ent*, from Entisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Quartzipsamments (*Quartz*, meaning dominated by quartz, plus *psamment*, the sandy suborder of the Entisols).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Typic* identifies the subgroup that typifies the great group. An example is Typic Quartzipsamments.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Generally, the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is thermic, uncoated Typic Quartzipsamments.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the "Soil Survey Manual" *(20)*. Many of the technical terms used in the descriptions are defined in "Soil Taxonomy" *(22)*. Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Albany Series

The Albany series consists of nearly level and gently sloping, somewhat poorly drained soils that formed in thick beds of loamy marine sediments. These soils are

sandy to a depth of 40 inches or more and have a loamy subsoil. They are along the lower slopes in broad areas on uplands and on slight knolls in the flatwoods. The soils are loamy, siliceous, thermic Grossarenic Paleudults.

Albany soils are associated with Blanton, Hurricane, and Ridgewood soils. Blanton soils are moderately well drained. Hurricane soils have a Bh horizon. Ridgewood soils are sandy to a depth of 80 inches or more.

Typical pedon of Albany fine sand, 0 to 5 percent slopes; 2,338 feet south of County Road 232 and 167 feet east of graded road; 1,002 feet south and 1,169 feet west of the northeast corner of sec. 8, T. 9 S., R. 15 E.

Ap—0 to 7 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; few fine roots; extremely acid; clear wavy boundary.

E1—7 to 24 inches; pale brown (10YR 6/3) fine sand; few medium distinct yellowish brown (10YR 5/6) mottles; single grained; loose; common medium distinct very dark grayish brown (10YR 3/2) root stains; few charcoal fragments; extremely acid; gradual wavy boundary.

E2—24 to 41 inches; very pale brown (10YR 7/3) fine sand; few fine faint yellowish brown mottles; single grained; loose; extremely acid; abrupt wavy boundary.

Btg1—41 to 60 inches; light gray (10YR 7/1) fine sandy loam; common medium prominent yellowish brown (10YR 5/6, 5/8) mottles; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

Btg2—60 to 80 inches; mottled yellowish brown (10YR 5/8), pale brown (10YR 6/3), and light gray (10YR 7/2) fine sandy loam; moderate medium subangular blocky structure; firm; very strongly acid.

The solum is 80 or more inches thick. Reaction ranges from extremely acid to slightly acid in the A and E horizons and from very strongly acid to moderately acid in the Bt horizon.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2. It is 6 to 8 inches thick.

The upper part of the E horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 6. It is mottled in some pedons. The lower part has chroma of 1 or 2 in some pedons. This horizon is sand or fine sand. It is 32 to 70 inches thick.

The Btg horizon generally has hue of 10YR, value of 5 to 7, and chroma of 1 or 2 and is mottled. In some pedons, however, the upper part of this horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 6 and is mottled in various shades of gray, yellow, or brown or has a mixture of these colors. This horizon is sandy loam or sandy clay loam.

Allanton Series

The Allanton series consists of nearly level, very poorly drained soils in depressions in the flatwoods. These soils are sandy to a depth of more than 80 inches. They formed in thick beds of sandy marine deposits. The soils are sandy, siliceous, thermic Grossarenic Haplaquods.

Allanton soils are associated with Leon, Lynn Haven, Mandarin, Ortega, Osier, and Ridgewood soils. Leon, Lynn Haven, and Mandarin soils have a Bh horizon within a depth of 30 inches. Ortega, Osier, and Ridgewood soils do not have a Bh horizon. Leon, Mandarin, Ortega, Osier, and Ridgewood soils are better drained than the Allanton soils.

Typical pedon of Allanton mucky fine sand, in an area of Lynn Haven and Allanton mucky fine sands, depressional; about 1,333 feet north of County Road 232 and 2,500 feet east of trail road; 2,000 feet north and 167 feet west of the southeast corner of sec. 5, T. 9 S., R. 15 E.

A1—0 to 10 inches; very dark gray (10YR 3/1) mucky fine sand; weak fine granular structure; friable; many fine and medium roots; many uncoated sand grains; very strongly acid; gradual wavy boundary.

A2—10 to 18 inches; very dark grayish brown (10YR 3/2) fine sand; weak fine granular structure; friable; common fine and medium roots; very strongly acid; gradual wavy boundary.

E1—18 to 24 inches; dark gray (10YR 4/1) fine sand; single grained; loose; very strongly acid; abrupt wavy boundary.

E2—24 to 52 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; very strongly acid; abrupt wavy boundary.

Bh1—52 to 65 inches; very dark grayish brown (10YR 3/2) fine sand; single grained; loose; coatings on approximately 50 percent of sand grains; very strongly acid; gradual wavy boundary.

Bh2—65 to 80 inches; very dark gray (10YR 3/1) fine sand; massive; friable; very strongly acid.

The solum generally is fine sand or sand to a depth of 80 inches or more, but the surface layer is mucky fine sand. Reaction is very strongly acid or strongly acid in the A and E horizons and extremely acid to strongly acid in the Bh horizon. Depth to the Bh horizon is 50 to 80 inches.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2, or it is neutral in hue and has value of 2 or 3. It is 10 to 20 inches thick.

The E horizon has hue of 10YR, value of 4 to 7, and chroma of 1 or 2. It is 34 to 42 inches thick.

The Bh1 horizon has hue of 7.5YR or 10YR, value of 2 or 3, and chroma of 1 or 2. It is 3 to 15 inches thick. The Bh2 horizon has hue of 10YR, 7.5YR, or 5YR, value of 2 or 3, and chroma of 1 or 2.

Alpin Series

The Alpin series consists of nearly level and gently sloping, excessively drained soils in the uplands. These soils are sandy to a depth of more than 80 inches. They formed in thick beds of sandy marine deposits. The soils are thermic, coated Typic Quartzipsamments.

Alpin soils are associated with Albany, Blanton, Ortega, and Wadley soils. Albany, Blanton, and Wadley soils have sandy A and E horizons that, combined, are 40 to 79 inches thick. These horizons are underlain by a loamy Bt horizon. Albany soils are somewhat poorly drained, Blanton and Ortega soils are moderately well drained, and Wadley soils are well drained.

Typical pedon of Alpin fine sand, 0 to 5 percent slopes; about 0.5 mile east of County Road 337 and 0.3 mile north of railroad track; 2,500 feet east and 167 feet south of the northwest corner of sec. 1, T. 10 S., R. 16 E.

A—0 to 6 inches; dark gray (10YR 4/1) fine sand; single grained; loose; few fine and medium roots; very strongly acid; gradual wavy boundary.

E1—6 to 18 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; few fine roots; common black charcoal fragments; very strongly acid; gradual wavy boundary.

E2—18 to 51 inches; very pale brown (10YR 7/4) fine sand; single grained; loose; few fine and medium roots; common clean sand grains; very strongly acid; gradual wavy boundary.

E&Bt—51 to 80 inches; very pale brown (10YR 8/3) fine sand (E); single grained; loose; common clean sand grains; yellowish brown (10YR 5/8) lamellae of loamy fine sand (B) about 3 to 6 inches long and ⅛ to ¼ inch thick; well coated sand grains; strongly acid.

The solum is 80 or more inches thick. The combined content of silt and clay is 5 to 10 percent between depths of 10 and 40 inches. Thin lamellae are at a depth of 50 to 80 inches. Reaction is very strongly acid to slightly acid throughout the profile.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 1 to 3. It is 3 to 7 inches thick.

The E horizon has hue of 10YR. It has value of 5 and chroma of 7 or 8, value of 6 or 7 and chroma of 3 to 8, or value of 8 and chroma of 3. In some pedons it has few or common fine and medium streaks that have hue of 10YR, value of 7 or 8, and chroma of 1 or 2. The color of the streaks is that of the uncoated sand grains and is not indicative of wetness. This horizon is sand or fine sand. It is 47 to 72 inches thick.

The E part of the E&Bt horizon has hue of 10YR, value of 7 or 8, and chroma of 1 to 6. It is sand or fine sand. It is 2 to 8 inches thick between the lamellae. In some pedons it has few or common small pockets of light gray or white, clean sand grains. The Bt part of this horizon occurs as lamellae that have hue of 7.5YR, value of 5, and chroma of 6 to 8; hue of 10YR, value of 5, and chroma of 4 to 8; or hue of 10YR, value of 6, and chroma of 6 to 8. The lamellae are loamy fine sand or sandy loam. They are 1/32 to ¼ inch thick and ½ inch to 24 inches long. They are at a depth of 50 to 80 inches and extend to a depth of more than 80 inches, generally increasing in thickness with increasing depth.

Blanton Series

The Blanton series consists of nearly level and gently sloping, moderately well drained soils on slight knolls and broad, gently rolling uplands. These soils are sandy to a depth of 40 inches or more and are loamy in the lower part. They formed in thick beds of sandy and loamy marine deposits. The soils are loamy, siliceous, thermic Grossarenic Paleudults.

Blanton soils are associated with Albany, Bonneau, Ortega, Otela, Penney, Ridgewood, and Wadley soils. Albany and Ridgewood soils are somewhat poorly drained. Bonneau soils have sandy A and E horizons that, combined, are 20 to 40 inches thick. Otela soils have limestone bedrock below a depth of 70 inches. Ortega, Penney, and Ridgewood soils are sandy to a depth of more than 80 inches. Penney soils have lamellae below a depth of 50 inches. They are excessively drained. Wadley soils are well drained.

Typical pedon of Blanton fine sand, 0 to 5 percent slopes; 2,672 feet south of graded road and 4,843 feet east of the Suwannee River; 2,672 feet south and 835 feet east of the northwest corner of sec. 32, T. 9 S., R. 14 E.

Ap—0 to 6 inches; dark gray (10YR 4/1) fine sand; weak medium granular structure; very friable; strongly acid; clear wavy boundary.

E1—6 to 29 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; many clean, white (10YR 8/2) sand grains; few charcoal fragments; strongly acid; gradual wavy boundary.

E2—29 to 44 inches; very pale brown (10YR7/3) fine sand; few medium prominent brownish yellow

(10YR 6/6) mottles; single grained; loose; strongly acid; abrupt wavy boundary.

Bt—44 to 60 inches; brownish yellow (10YR 6/6) sandy clay loam; few medium distinct yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; very friable; very strongly acid; gradual wavy boundary.

Btg—60 to 80 inches; gray (10YR 5/1) sandy clay loam; many coarse prominent brownish yellow (10YR 6/6), common coarse prominent red (10YR 5/8), and few medium prominent yellowish red (5YR 5/8) mottles; moderate medium subangular blocky structure; firm; strongly acid.

The thickness of the solum ranges from 60 to more than 80 inches. Reaction ranges from very strongly acid to moderately acid throughout the profile unless the surface has been limed.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It is 6 to 10 inches thick.

The E horizon has hue of 10YR and has value of 5 and chroma of 4 or value of 6 to 8 and chroma of 3 or 4. It is mottled in shades of gray, yellow, or brown in some pedons. In some pedons is has few to many fine and medium pockets of clean sand grains. This horizon is 33 to 65 inches thick.

The Bt horizon has hue of 10YR and has value of 5 or 6 and chroma of 3 to 6 or value of 7 and chroma of 2 to 6. In some pedons it has gray, yellow, brown, or red mottles. Gray mottles indicative of wetness are within the upper 10 inches of this horizon.

Bonneau Series

The Bonneau series consists of nearly level and gently sloping, moderately well drained soils on slight knolls in the flatwoods and on broad uplands. These soils are sandy to a depth of 20 inches or more and are loamy in the lower part. They formed in thick beds of sandy and loamy marine deposits. The soils are loamy, siliceous, thermic Arenic Paleudults.

Bonneau soils are associated with Albany, Blanton, Eunola, Meggett, Ortega, and Shadeville soils. Albany and Blanton soils have sandy A and E horizons that, combined, are more than 40 inches thick. Shadeville soils have high base saturation. Meggett soils have sandy A and E horizons that, combined, are less than 20 inches thick. They are poorly drained. Ortega soils are sandy to a depth of more than 80 inches. Eunola soils have a Bt horizon within a depth of 20 inches and a C horizon below a depth of 60 inches.

Typical pedon of Bonneau fine sand, 0 to 5 percent slopes; about 1.5 miles east of U.S. 129 and 100 feet south of graded road; 800 feet west and 100 feet south of the northeast corner of sec. 32, T. 9 S., R. 15 E.

A—0 to 6 inches; very dark gray (10YR 3/2) fine sand; weak fine granular structure; very friable; many fine and medium roots; strongly acid; gradual wavy boundary.

E1—6 to 16 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; many fine and medium roots; very strongly acid; clear wavy boundary.

E2—16 to 35 inches; very pale brown (10YR 7/3) fine sand; single grained; loose; common fine and medium roots; very strongly acid; clear wavy boundary.

Bt1—35 to 44 inches; yellowish brown (10YR 6/6) sandy clay loam; moderate medium subangular blocky structure; friable; few fine and medium roots; very strongly acid; gradual wavy boundary.

Bt2—44 to 69 inches; light yellowish brown (10YR 6/4) sandy clay loam; common medium distinct light brownish gray (10YR 6/2) and few fine distinct strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; very strongly acid; gradual wavy boundary.

Bt3—69 to 80 inches; mottled gray (10YR 6/1, 7/2), yellowish brown (10YR 5/8), and strong brown (7.5YR 5/8) sandy clay loam; moderate medium subangular blocky structure; sand grains coated and bridged with clay; very strongly acid.

The thickness of the solum ranges from 60 to more than 80 inches. Reaction is very strongly acid or strongly acid throughout the profile unless the surface has been limed.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It is 2 to 9 inches thick.

The E horizon has hue of 10YR or 2.5YR, value of 5 to 7, and chroma of 2 to 6. In some pedons it has few to many fine and medium pockets of clean sand grains. This horizon is 11 to 30 inches thick.

The Bt horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 3 to 8. It is mottled in shades of gray, brown, red, or yellow in the lower part. Gray mottles indicative of wetness are within a depth of 60 inches. This horizon is dominantly fine sandy loam, sandy loam, or sandy clay loam, but in some pedons the lower part is sandy clay.

Dorovan Series

The Dorovan series consists of nearly level, very poorly drained, organic soils in swamps on flood plains and in the flatwoods. These soils are organic to a depth

of more than 51 inches. They formed from herbaceous plant material mixed with woody plant material. The soils are dysic, thermic Typic Medisaprists.

Dorovan soils are associated with Osier, Pamlico, and Surrency soils. Osier and Surrency soils are of mineral origin. Osier soils have a high water table within 12 inches of the surface. They are sandy to a depth of 80 inches or more. Surrency soils have a Btg horizon at a depth of 20 to 40 inches. Pamlico soils formed in sapric material less than 50 inches deep over sandy material.

Typical pedon of Dorovan muck, in an area of Pamlico-Dorovan mucks, frequently flooded; about 1.4 miles north of County Road 340 and 0.7 mile west of trail road; 167 feet south and 1,670 feet east of the northwest corner of sec. 10, T. 8 S., R. 15 E.

Oa1—0 to 6 inches; black (10YR 2/1) muck; about 33 percent fiber before rubbing, less than 10 percent after rubbing; massive; very friable; many medium and few coarse roots; extremely acid; gradual wavy boundary.

Oa2—6 to 34 inches; dark reddish brown (5YR 3/3) muck; about 50 percent fiber before rubbing, less than 10 percent after rubbing; massive; very friable; many fine and common coarse roots; extremely acid; gradual wavy boundary.

Oa3—34 to 65 inches; very dark grayish brown (10YR 3/2) muck; about 30 percent fiber before rubbing, less than 10 percent after rubbing; massive; nonsticky; many fine roots; less than 10 percent mineral material; extremely acid; clear wavy boundary.

Cg—65 to 80 inches; gray (10YR 6/1) fine sand; single grained; nonsticky; strongly acid.

The organic material is 51 to more than 80 inches thick. It is extremely acid (as measured by the 0.01 molar calcium chloride procedure). The mineral horizon is very strongly acid or strongly acid.

The surface tier has hue of 5YR to 10YR, value of 2 to 4, and chroma of 1 to 3. The content of fibers is about 40 to 60 percent before rubbing and 20 percent after rubbing.

The subsurface tier has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3. The content of fibers is about 40 percent before rubbing and less than 10 percent after rubbing.

The bottom tier has the same hue, value, and chroma as the subsurface tier. The content of fibers is about 30 percent before rubbing, and fibers make up less than ⅙ of the volume after rubbing.

The Cg horizon, if it occurs, is sandy or loamy material. This material is below a depth of 51 inches. It has hue of 10YR, value of 5 to 7, and chroma of 1 or 2.

Elloree Series

The Elloree series consists of nearly level, poorly drained soils on flood plains. These soils are sandy to a depth of 20 to 40 inches and are loamy in the lower part. They formed in sandy and loamy sediments. The soils are loamy, siliceous, thermic Arenic Ochraqualfs.

Elloree soils are associated with Albany soils, Fluvaquents, and Garcon, Leon, Osier, and Ridgewood soils. Albany soils have a Bt horizon at a depth of 40 to 80 inches. Albany, Garcon, and Ridgewood soils are somewhat poorly drained. Garcon soils have a Bt horizon within a depth of 40 inches. Osier and Ridgewood soils are sandy to a depth of more than 80 inches. Fluvaquents are stratified and have gravel in the lower part. Leon soils have a Bh horizon within a depth of 30 inches.

Typical pedon of Elloree loamy fine sand, in an area of Elloree-Osier-Fluvaquents complex, frequently flooded; about 2,500 feet north and 833 feet west of the southeast corner of sec. 30, T. 8 S., R. 14 E.

A—0 to 4 inches; very dark grayish brown (10YR 3/2) loamy fine sand; weak fine granular structure; friable; few fine, medium, and large roots; neutral; clear wavy boundary.

Eg1—4 to 22 inches; light brownish gray (10YR 6/2) loamy fine sand; single grained; loose; few fine roots; neutral; gradual wavy boundary.

Eg2—22 to 25 inches; light gray (10YR 7/2) loamy fine sand; weak medium granular structure; friable; neutral; gradual wavy boundary.

Btg1—25 to 37 inches; gray (10YR 6/1) sandy clay loam; moderate medium subangular blocky structure; friable; many fine roots along faces of peds; neutral; gradual wavy boundary.

Btg2—37 to 62 inches; light gray (10YR 7/1) sandy clay loam; few fine faint dark grayish brown mottles; moderate medium subangular blocky structure; friable; neutral; abrupt wavy boundary.

Cg—62 to 80 inches; white (10YR 8/2) sand; single grained; loose; mildly alkaline.

The solum is more than 40 inches thick. Reaction is strongly acid to slightly acid in the A horizon, moderately acid to neutral in the E horizon, and neutral to moderately alkaline throughout the rest of the profile.

The A horizon has hue of 10YR or 2.5Y or is neutral in hue. It has value of 2 or 3 and chroma of 0 to 3. It is 3 to 7 inches thick.

The E horizon has hue of 10YR to 2.5Y, value of 4 to 7, and chroma of 1 or 2. It is loamy sand, sand, or fine sand. It is 14 to 30 inches thick.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2, or it is neutral in hue and has value of 4 to 7. It is 15 to 30 inches thick.

The Cg horizon has hue of 10YR to 5Y, value of 5 to 8, and chroma of 1 or 2. It is sandy clay loam, sandy loam, loamy sand, or sand.

Eunola Series

The Eunola series consists of nearly level and gently sloping, moderately well drained soils in the uplands. These soils formed in thick beds of sandy and loamy marine deposits. They are fine-loamy, siliceous, thermic Aquic Hapludults.

Eunola soils are associated with Albany, Blanton, Bonneau, Meggett, Ortega, and Shadeville soils. Albany and Blanton soils have sandy A and E horizons that, combined, are more than 40 inches thick. Bonneau and Shadeville soils have sandy A and E horizons that, combined, are more than 20 inches thick. Shadeville soils have high base saturation. Meggett soils are poorly drained. Ortega soils are sandy to a depth of more than 80 inches.

Typical pedon of Eunola fine sand, in an area of Eunola-Bonneau fine sands, 0 to 5 percent slopes; about 2,200 feet north of Florida Highway 47 and 300 feet east of U.S. 129; about 1,500 feet north and 1,300 feet east of the southwest corner of sec. 9, T. 10 S., R. 15 E.

Ap—0 to 9 inches; very dark grayish brown (10YR 3/2) fine sand; weak fine granular structure; very friable; few fine roots; moderately alkaline; clear wavy boundary.

E—9 to 19 inches; pale brown (10YR 6/3) fine sand; many very dark grayish brown splotches; few charcoal fragments; weak fine granular structure; very friable; few fine roots; moderately acid; abrupt wavy boundary.

Bt1—19 to 26 inches; yellowish brown (10YR 5/6) fine sandy loam; moderate medium subangular blocky structure; friable; few very dark grayish brown root stains; very strongly acid; gradual wavy boundary.

Bt2—26 to 35 inches; yellowish brown (10YR 5/6) sandy clay loam; common medium distinct light brownish gray (10YR 6/2), dark brown (10YR 4/3), and strong brown (7.5YR 5/6) mottles; moderate medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

BC—35 to 63 inches; mottled light gray (10YR 7/2), grayish brown (10YR 5/2), dark brown (7.5YR 4/4), and brownish yellow (10YR 6/8) fine sandy loam and pockets of sandy clay loam; weak medium subangular blocky structure; friable; very strongly acid; gradual wavy boundary.

Cg—63 to 80 inches; light gray (10YR 7/2) fine sandy loam; many coarse prominent brownish yellow (10YR 6/6), strong brown (7.5YR 5/6), and reddish yellow (7.5YR 6/6) mottles; pockets of sandy clay loam; massive; friable; very strongly acid.

The thickness of the solum ranges from 40 to more than 60 inches. Reaction is very strongly acid to slightly acid in the A horizon and very strongly acid to moderately acid throughout the rest of the profile.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It is 4 to 10 inches thick.

The E horizon has hue of 10YR, value of 5 or 6, and chroma of 3 or 4. It is fine sand, loamy fine sand, or sandy loam. It is 0 to 12 inches thick.

The Bt horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 6. It is mottled in shades of red, brown, yellow, or gray. This horizon is sandy clay loam, clay loam, fine sandy loam, or sandy loam. It is 15 to more than 40 inches thick.

The BC horizon has hue of 7.5YR or 10YR or is neutral in hue. It has value of 4 to 7 and chroma of 0 to 6. In some pedons it is mottled in shades of red, brown, yellow, or gray. This horizon is sandy loam, fine sandy loam, or sandy clay loam. It is 4 to 20 inches thick.

The C horizon has colors similar to those of the BC horizon. It is sandy loam, fine sandy loam, loamy sand, loamy fine sand, fine sand, or sand.

Garcon Series

The Garcon series consists of nearly level and gently sloping, somewhat poorly drained soils in the slightly higher positions on flood plains. These soils are sandy to a depth of 20 to 40 inches and are loamy in the lower part. They formed in sandy and loamy marine sediments. The soils are loamy, siliceous, thermic Arenic Hapludults.

Garcon soils are associated with Albany and Elloree soils, Fluvaquents, and Osier and Penney soils. Albany soils have sandy A and E horizons that, combined, are 40 to 79 inches thick. Elloree soils are poorly drained. Fluvaquents are stratified and are alkaline. Osier and Penney soils are sandy to a depth of more than 80 inches. Osier soils are poorly drained. Penney soils are excessively drained.

Typical pedon of Garcon fine sand, 0 to 5 percent slopes, occasionally flooded; about 0.4 mile north of

graded road and 0.75 mile east of the Suwannee River; 2,171 feet north and 2,171 feet east of the southwest corner of sec. 4, T. 8 S., R. 14 E.

A—0 to 7 inches; very dark grayish brown (10YR 3/2) fine sand; single grained; loose; many fine roots; very strongly acid; gradual wavy boundary.
E1—7 to 17 inches; brown (10YR 5/3) fine sand; single grained; loose; many fine roots; very strongly acid; gradual wavy boundary.
E2—17 to 29 inches; pale brown (10YR 6/3) fine sand; common medium distinct brownish yellow (10YR 6/6, 6/8) mottles; single grained; loose; very strongly acid; abrupt wavy boundary.
Bt1—29 to 40 inches; pale brown (10YR 6/3) fine sandy loam; many coarse prominent yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6, 6/8) mottles; weak medium subangular blocky structure; very friable; few medium roots; extremely acid; gradual wavy boundary.
Bt2—40 to 58 inches; gray (10YR 6/1) sandy clay loam; many coarse prominent red (2.5YR 4/8) and light red (2.5YR 6/6) and common medium prominent yellowish brown (10YR 5/6) and brownish yellow (10YR 6/6) mottles; moderate medium subangular blocky structure; firm; few large roots; extremely acid; gradual wavy boundary.
C—58 to 80 inches; light gray (10YR 7/2) fine sand; common medium prominent brownish yellow (10YR 6/6, 6/8) mottles; weak fine granular structure; very friable; extremely acid.

The thickness of the solum ranges from 45 to 60 inches. Reaction is extremely acid to strongly acid throughout the profile.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1 or 2. It is 5 to 8 inches thick.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 6. It is mottled in shades of brown, yellow, or gray in the lower part. This horizon is loamy fine sand, loamy sand, fine sand, or sand. It is 13 to 35 inches thick.

The Bt1 horizon has hue of 10YR, value of 5 or 6, and chroma of 3 to 6. It is mottled in shades of gray, yellow, or brown. This horizon is sandy loam or fine sandy loam. It is 5 to 20 inches thick.

The Bt2 horizon has hue of 10YR, value of 5 or 6, and chroma of 1 or 2. It is mottled in shades of gray, brown, yellow, or red. The content of silt is less than 20 percent. This horizon is dominantly sandy loam, fine sandy loam, or sandy clay loam, but some pedons have pockets of sandy clay. By weighted average, the content of clay in the upper 20 inches of the argillic horizon is less than 18 percent. In some pedons the lower part of the Bt2 horizon ranges to 21 percent clay. This horizon is 0 to 15 inches thick.

The C horizon, if it occurs, has hue of 10YR, value of 6 or 7, and chroma of 1 or 2. It is mottled in shades of red, brown, yellow, or gray. This horizon is sand or fine sand.

Hurricane Series

The Hurricane series consists of nearly level and gently sloping, somewhat poorly drained soils on slight rises in the flatwoods. These soils are sandy to a depth of more than 80 inches. They formed in thick beds of marine deposits. The soils are sandy, siliceous, thermic Grossarenic Entic Haplohumods.

Hurricane soils are associated with Albany, Blanton, Leon, Mandarin, Ortega, and Ridgewood soils. Albany and Blanton soils have a loamy Bt horizon. Blanton soils are moderately well drained. Leon and Mandarin soils have a Bh horizon within a depth of 30 inches. Leon soils are poorly drained. Ortega and Ridgewood soils do not have a Bh horizon. Ortega soils are moderately well drained.

Typical pedon of Hurricane fine sand, 0 to 5 percent slopes; 1.1 miles south of County Road 340 and 4.2 miles east of U.S. 129; about 2,400 feet south and 1,850 feet west of the northeast corner of sec. 22, T. 8 S., R. 15 E.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) fine sand; single grained; loose; very friable; many fine, medium, and large roots; very strongly acid; clear wavy boundary.
E1—6 to 20 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; many fine medium and large roots; common medium distinct black (10YR 2/1) charcoal fragments; white (10YR 8/2) streaks and splotches; very strongly acid; gradual wavy boundary.
E2—20 to 29 inches; pale brown (10YR 6/3) fine sand; common medium distinct brownish yellow (10YR 6/8) and light brownish gray (10YR 6/2) mottles; single grained; loose; very strongly acid; clear wavy boundary.
E3—29 to 65 inches; light gray (10YR 7/2) fine sand; common medium distinct yellowish brown (10YR 5/6, 5/8) mottles; single grained; loose; few medium and large roots; very strongly acid; clear wavy boundary.
E4—65 to 72 inches; pinkish gray (7.5YR 6/2) sand; single grained; loose; extremely acid; clear wavy boundary.
Bh—72 to 80 inches; dark reddish brown (5YR 3/2) fine sand; weak fine granular structure; very friable; extremely acid.

The solum is 80 or more inches thick. The combined content of silt and clay is less than 5 percent between depths of 10 and 40 inches. Depth to the spodic horizon is 51 to 79 inches. Reaction is extremely acid to moderately acid throughout the profile.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. It is 3 to 8 inches thick.

The E horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 1 to 4. In some pedons it is mottled in shades of brown, gray, or yellow. It is sand or fine sand. Many of the sand grains are uncoated. This horizon is 46 to 65 inches thick.

The Bh horizon has hue of 10YR, 7.5YR, or 5YR, value of 2 to 5, and chroma of 1 to 4. It is sand or fine sand. The sand grains are well coated with organic matter.

Kershaw Series

The Kershaw series consists of nearly level to moderately sloping, excessively drained soils in the uplands. These soils are sandy to a depth of more than 80 inches. They formed in thick beds of sandy marine deposits. The soils are thermic, uncoated Typic Quartzipsamments.

Kershaw soils are associated with Alpin, Ortega, Penney, Ridgewood, and Wadley soils. Alpin soils have a coated sandy texture to a depth of 80 inches and have lamellae below a depth of 50 inches. Ortega soils are moderately well drained. Penney soils have lamellae below a depth of 60 inches. Ridgewood soils are somewhat poorly drained. Wadley soils have sandy A and E horizons that, combined, are 40 to 79 inches thick and have a loamy Bt horizon. They are well drained.

Typical pedon of Kershaw fine sand, gently rolling; about 1,837 feet south of trail road and 6,012 feet west of Florida Highway 47; about 1,667 feet south and 500 feet west of the northeast corner of sec. 36, T. 8 S., R. 15 E.

A—0 to 5 inches; very dark grayish brown (10YR 3/2) fine sand; single grained; loose; few fine and medium roots; very strongly acid; clear wavy boundary.

C1—5 to 45 inches; pale brown (10YR 6/3) fine sand; single grained; loose; common fine black charcoal fragments; few medium roots; strongly acid; gradual wavy boundary.

C2—45 to 80 inches; very pale brown (10YR 7/3) fine sand; single grained; loose; very strongly acid.

The sandy material extends to a depth of 80 inches. The combined content of silt and clay is less than 5 percent between depths of 10 and 40 inches. Reaction is very strongly acid or strongly acid throughout the profile.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It is 2 to 6 inches thick. The C horizon has hue of 10YR, value of 5 to 8, and chroma of 3 to 8.

Leon Series

The Leon series consists of nearly level, poorly drained soils in broad areas in the flatwoods. These soils are sandy to a depth of more than 80 inches. They formed in thick beds of sandy marine deposits. The soils are sandy, siliceous, thermic Aeric Haplaquods.

Leon soils are associated with Allanton, Mandarin, Pottsburg, Sapelo, and Wesconnett soils. Allanton soils have a dark A horizon that is thicker than that of the Leon soils. They also have a thicker E horizon. They are very poorly drained. Mandarin soils are somewhat poorly drained. Pottsburg soils have an E horizon that is thicker than that of the Leon soils. Sapelo soils have a Btg horizon below the Bh horizon. Wesconnett soils have a dark A horizon that is thicker than that of the Leon soils and that is directly above a Bh horizon. They are very poorly drained.

Typical pedon of Leon fine sand; 0.3 mile south of County Road 340 and 3.35 miles east of U.S. 129; about 1,900 feet north and 1,000 feet west of the southeast corner of sec. 16, T. 8 S., R. 15 E.

Ap—0 to 6 inches; very dark gray (10YR 3/1) fine sand; single grained; very friable; many fine and medium roots; very strongly acid; gradual wavy boundary.

E1—6 to 15 inches; grayish brown (10YR 5/2) fine sand; common medium distinct very dark gray (10YR 3/1) mottles along root channels; single grained; loose; few fine and medium roots; very strongly acid; clear wavy boundary.

E2—15 to 21 inches; light brownish gray (10YR 6/2) fine sand; single grained; loose; few fine and medium roots; very strongly acid; abrupt wavy boundary.

Bh1—21 to 28 inches; black (10YR 2/1) fine sand; weak medium subangular blocky structure; friable; weak cementation in parts of the horizon; sand grains coated with organic matter; few fine roots; very strongly acid; clear wavy boundary.

Bh2—28 to 40 inches; dark reddish brown (5YR 2/2) fine sand; few medium distinct black (10YR 2/1) mottles; weak fine subangular blocky structure; friable; weak cementation in parts of the horizon; sand grains coated with organic matter; few fine roots; very strongly acid; clear wavy boundary.

BC—40 to 60 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; many uncoated sand

grains; few fine roots; very strongly acid; clear wavy boundary.

C—60 to 80 inches; very pale brown (10YR 7/3) fine sand; few fine faint pale brown streaks; single grained; loose; many uncoated sand grains; very strongly acid.

The thickness of the solum ranges from 30 to more than 80 inches. The texture is sand or fine sand to a depth of at least 80 inches. Reaction ranges from extremely acid to strongly acid throughout the profile unless the surface has been limed.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1, or it is neutral in hue and has value of 2 to 4. It is 2 to 8 inches thick.

The E horizon has hue of 10YR or 2.5Y, value of 6 to 8, and chroma of 2, or it is neutral in hue and has value of 5 to 8. In some pedons it has mottles with higher chroma and vertical black or very dark gray streaks. This horizon is 4 to 22 inches thick.

The Bh horizon has hue of 5YR, 7.5YR, or 10YR, value of 2 or 3, and chroma of 1 to 3. The sand grains are well coated with organic matter. This horizon is 6 to 35 inches thick.

The BC horizon, if it occurs, has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 2 to 4. It is 0 to 5 inches thick.

The C horizon has hue of 7.5YR or 10YR, value of 4 to 8, and chroma of 3 or 4. Some pedons have a bisequum of E′ and B′h horizons below the Bh horizon.

Lynn Haven Series

The Lynn Haven series consists of nearly level, very poorly drained soils in depressions. These soils are sandy to a depth of more than 80 inches. They formed in thick beds of sandy marine deposits. The soils are sandy, siliceous, thermic Typic Haplaquods.

Lynn Haven soils are associated with Allanton, Leon, Mandarin, and Osier soils. Leon, Mandarin, and Osier soils do not have an umbric epipedon. Mandarin soils are somewhat poorly drained. Osier soils do not have a spodic horizon. Allanton soils have a spodic horizon below a depth of 50 inches.

Typical pedon of Lynn Haven mucky fine sand, in an area of Lynn Haven and Allanton mucky fine sands, depressional; about 0.6 mile north of County Road 232 and 0.5 mile east of trail road; 1,500 feet south and 166 feet east of the northwest corner of sec. 4, T. 9 S., R. 15 E.

A1—0 to 10 inches; black (10YR 2/1) mucky fine sand; single grained; loose; many fine medium roots; very strongly acid; gradual wavy boundary.

A2—10 to 18 inches; very dark gray (10YR 3/1) fine sand; single grained; loose; common fine and medium roots; very strongly acid; clear wavy boundary.

E—18 to 25 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; few fine roots; very strongly acid; abrupt wavy boundary.

Bh1—25 to 46 inches; black (5YR 2/1) fine sand; weak fine granular structure; friable; sand grains coated with organic matter; very strongly acid; gradual wavy boundary.

Bh2—46 to 51 inches; dark brown (10YR 3/3) fine sand; weak fine granular structure; friable; sand grains coated with organic matter; very strongly acid; gradual wavy boundary.

Bh3—51 to 80 inches; black (5YR 2/1) fine sand; weak fine granular structure; loose; sand grains coated with organic matter; very strongly acid.

The texture generally is fine sand or sand to a depth of 80 inches or more, but the surface layer is mucky fine sand. Reaction ranges from extremely acid to strongly acid throughout the profile.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1, or it is neutral in hue and has value of 2 or 3. It is 8 to 20 inches thick.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It is 2 to 18 inches thick.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 to 3. The sand grains are well coated with organic matter.

Mandarin Series

The Mandarin series consists of nearly level, somewhat poorly drained, acid soils in the flatwoods. These soils are sandy to a depth of more than 80 inches. They formed in thick beds of sandy marine deposits. The soils are sandy, siliceous, thermic Typic Haplohumods.

Mandarin soils are associated with Hurricane, Leon, and Ortega soils. Hurricane soils have a Bh horizon below a depth of 50 inches. Leon soils are poorly drained. Ortega soils do not have a Bh horizon. They are moderately well drained.

Typical pedon of Mandarin fine sand; 0.5 mile south of County Road 340 and 3.7 miles east of U.S. 129; about 1,000 feet north and 700 feet east of the southwest corner of sec. 15, T. 8 S., R. 15 E.

Ap—0 to 6 inches; dark gray (10YR 4/1) fine sand; single grained; weak fine granular structure; many fine roots; few fine charcoal fragments; extremely acid; clear wavy boundary.

E—6 to 20 inches; light gray (10YR 7/2) fine sand; common medium distinct pinkish gray (7.5YR 7/2) mottles; single grained; loose; common fine and medium roots; strongly acid; abrupt wavy boundary.

Bh1—20 to 24 inches; black (5YR 2/1) fine sand; single grained; weak medium granular structure; extremely acid; clear wavy boundary.

Bh2—24 to 29 inches; dark reddish brown (5YR 3/2) fine sand; single grained; weak fine granular structure; extremely acid; gradual wavy boundary.

E′1—29 to 59 inches; pale brown (10YR 6/3) fine sand; single grained; loose; extremely acid; gradual wavy boundary.

E′2—59 to 71 inches; brown (7.5YR 5/2) fine sand; single grained; loose; extremely acid; gradual wavy boundary.

B′h—71 to 80 inches; black (5YR 2/1) fine sand; single grained; loose; extremely acid.

The solum is more than 35 inches thick. Reaction is extremely acid to moderately acid throughout the profile.

The A horizon has hue of 10YR, value of 2 to 6, and chroma of 1, or it is neutral in hue and has value of 3 to 5. It is 2 to 7 inches thick.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. It is sand or fine sand. It is 10 to 22 inches thick.

The Bh horizon has hue of 2.5YR, value of 2 or 3, and chroma of 2 to 4; hue of 5YR, value of 2 or 3, and chroma of 1 to 4; hue of 7.5YR, value of 3, and chroma of 2; or hue of 10YR, value of 2 or 3, and chroma of 1 to 3. It is sand or fine sand. It is 8 to 25 inches thick. This horizon is weakly cemented in places. The sand grains are well coated with organic matter.

The BE horizon, if it occurs, has hue of 10YR, value of 4 to 6, and chroma of 2 to 4; hue of 7.5YR, value of 4, and chroma of 2 to 4; or hue of 7.5YR, value of 5, and chroma of 4. It is sand or fine sand. It is 0 to 17 inches thick.

The E′ horizon has hue of 10YR, value of 5 to 8, and chroma of 1 to 3. It is sand or fine sand. It is 10 to 45 inches thick.

The B′h horizon has the same color range as the Bh horizon. It extends to a depth of more than 80 inches. It is sand or fine sand. This horizon is weakly cemented in places. The sand grains are coated with organic matter.

Meggett Series

The Meggett series consists of nearly level, poorly drained soils adjacent to drainageways. These soils are sandy to a depth of less than 20 inches and have a clayey subsoil. They formed in clayey and sandy marine deposits. The soils are fine, mixed, thermic Typic Albaqualfs.

The Meggett soils in this survey area are taxadjuncts to the series because they have a higher content of montmorillonitic clay than is defined as the range for the series. This difference, however, does not alter the use and management of the soils.

Meggett soils are associated with Bonneau, Eunola, Garcon, and Surrency soils. Bonneau, Garcon, and Surrency soils have a Bt horizon below a depth of 20 inches. Bonneau and Eunola soils are moderately well drained. Garcon and Surrency soils have low base saturation. Garcon soils are somewhat poorly drained.

Typical pedon of Meggett fine sand, frequently flooded; approximately 2.2 miles south of County Road 344 and 500 feet east of U.S. 129; about 250 feet north and 1,400 feet west of the southeast corner of sec. 5, T. 10 S., R. 15 E.

A—0 to 4 inches; very dark brown (10YR 2/2) fine sand; weak fine granular structure; very friable; few fine roots; slightly acid; clear wavy boundary.

E—4 to 11 inches; light brownish gray (10YR 6/2) fine sand; common fine faint brown (10YR 5/3) and pale brown (10YR 6/3) and common fine distinct grayish brown (10YR 5/2) mottles; weak fine granular structure; very friable; few fine roots; strongly acid; abrupt wavy boundary.

Btg1—11 to 31 inches; light brownish gray (10YR 6/2) sandy clay; many coarse prominent red (2.5YR 4/8) and many medium prominent strong brown (7.5YR 5/8) mottles; moderate medium subangular blocky structure; sticky; few medium roots; strongly acid; gradual wavy boundary.

Btg2—31 to 40 inches; mottled gray (10YR 6/1) and yellowish brown (10YR 5/6) sandy clay; moderate medium subangular blocky structure; sticky; many concretions of calcium carbonate; strongly acid; gradual wavy boundary.

Cg—40 to 80 inches; white (10YR 8/1) sandy clay loam; many medium prominent brownish yellow (10YR 6/6) mottles; massive; friable; pockets of sandy clay; many ¼-inch concretions of calcium carbonate; moderately alkaline.

The solum is 40 to more than 80 inches thick. Reaction is very strongly acid to slightly acid in the A and E horizons, strongly acid to moderately alkaline in the B horizon, and slightly acid to moderately alkaline in the Cg horizon.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2. It is 3 to 6 inches thick.

The E horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. It is sand or fine sand. It is 0 to 7

inches thick. In pedons that do not have this horizon, the texture changes abruptly between the A and Btg horizons.

The Btg horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. It has few to many mottles in shades of gray, yellow, brown, or red. It is sandy clay or sandy clay loam. It is 29 to 65 inches thick. The number of fine or medium concretions of soft or hard calcium carbonate ranges from none to many.

Some pedons have a BCg horizon. This horizon has hue of 10YR to 5Y, value of 4 to 7, and chroma of 1 or 2. It is sandy clay or sandy clay loam. The number of fine or medium concretions of soft or hard calcium carbonate ranges from none to many. The Cg horizon ranges from sand to clay.

Ortega Series

The Ortega series consists of nearly level and gently sloping, moderately well drained soils on low ridges in the flatwoods and in transitional areas between the uplands and the flatwoods. These soils are sandy to a depth of 80 inches or more. They formed in thick beds of sandy marine deposits. The soils are thermic, uncoated Typic Quartzipsamments.

Ortega soils are associated with Albany, Blanton, Hurricane, Penney, and Ridgewood soils. Albany and Blanton soils have a Bt horizon at a depth of 40 to 80 inches. Albany, Hurricane, and Ridgewood soils are somewhat poorly drained. Hurricane soils have a Bh horizon. Penney soils are excessively drained.

Typical pedon of Ortega fine sand, 0 to 5 percent slopes; 167 feet north of County Road 232 and 2,171 feet west of trail road; 3,173 feet south and 334 feet west of the northeast corner of sec. 4, T. 9 S., R. 15 E.

Ap—0 to 6 inches; very dark grayish brown (10YR 3/2) fine sand; weak fine granular structure; very friable; many fine roots; very strongly acid; clear wavy boundary.

C1—6 to 52 inches; brown (10YR 5/3) fine sand; single grained; loose; few clean, white (10YR 8/1) sand grains; few charcoal fragments; few fine roots; very strongly acid; gradual wavy boundary.

C2—52 to 60 inches; pale brown (10YR 6/3) fine sand; common medium distinct dark yellowish brown (10YR 4/6), yellowish brown (10YR 5/6), and brownish yellow (10YR 6/6) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

C3—60 to 80 inches; light gray (10YR 7/2) fine sand; few fine distinct yellowish brown (10YR 5/6) mottles; single grained; loose; strongly acid.

The texture is fine sand or sand to a depth of 80 inches or more. The combined content of silt and clay is less than 5 percent between depths of 10 and 40 inches. Reaction ranges from very strongly acid to slightly acid throughout the profile unless the surface has been limed.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It is 3 to 6 inches thick.

The upper part of the C horizon has hue of 10YR, value of 5 to 7, and chroma of 3 to 8. White or light gray mottles in this part of the horizon are the result of uncoated sand grains and are not indicative of wetness. The lower part has hue of 10YR, value of 6 to 8, and chroma of 1 or 2.

Osier Series

The Osier series consists of nearly level, poorly drained soils on flood plains. These soils are sandy to a depth of more than 80 inches. They formed in thick beds of sandy marine deposits. The soils are siliceous, thermic Typic Psammaquents.

Osier soils are associated with Albany and Elloree soils, Fluvaquents, and Garcon, Leon, and Ridgewood soils. Albany and Elloree soils have a Bt horizon at a depth of 40 to 80 inches. Albany, Garcon, and Ridgewood soils are somewhat poorly drained. Garcon soils have a Bt horizon within a depth of 40 inches. Fluvaquents are stratified and have gravel in the lower part. Leon soils have a Bh horizon within a depth of 30 inches.

Typical pedon of Osier fine sand, in an area of Elloree-Osier-Fluvaquents complex, frequently flooded; 500 feet south of graded road and approximately 167 feet west of trail road; 2,500 feet south and 1,300 feet east of the northwest corner of sec. 32, T. 8 S., R. 14 E.

A—0 to 7 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear wavy boundary.

Cg1—7 to 11 inches; gray (10YR 5/1) fine sand; single grained; loose; common fine roots; very strongly acid; gradual wavy boundary.

Cg2—11 to 19 inches; light brownish gray (10YR 6/2) fine sand; few fine distinct yellowish brown (10YR 5/4) mottles; single grained; loose; few fine roots; very strongly acid; gradual wavy boundary.

Cg3—19 to 45 inches; light gray (10YR 7/2) fine sand; common medium prominent brownish yellow (10YR 6/8) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

Cg4—45 to 60 inches; light gray (10YR 7/1) fine sand; common medium prominent strong brown (7.5YR 5/6) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

Cg5—60 to 80 inches; white (10YR 8/2) fine sand; single grained; loose; very strongly acid.

The combined content of silt and clay is 5 to 10 percent between depths of 10 and 40 inches. Reaction ranges from very strongly acid to moderately acid throughout the profile.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 3 or hue of 2.5Y, value of 5, and chroma of 2. It is 3 to 7 inches thick.

The Cg horizon has hue of 10YR, value of 4 to 8, and chroma of 1 or 2, or it is neutral in hue and has value of 4 to 8.

Otela Series

The Otela series consists of nearly level and gently sloping, moderately well drained soils on broad uplands. These soils are sandy to a depth of 40 inches or more and are loamy in the lower part. They formed in marine sediments deposited on karst topography. The soils are loamy, siliceous, thermic Grossarenic Paleudalfs.

Otela soils are associated with Blanton, Shadeville, Penney, and Wadley soils. Blanton soils have base saturation of less than 35 percent. Shadeville soils have hard limestone bedrock below a depth of 48 inches. Penney soils do not have an argillic horizon. Wadley soils are well drained. They have base saturation of less than 35 percent.

Typical pedon of Otela fine sand, in an area of Shadeville-Otela fine sands, 0 to 5 percent slopes; 200 feet north of graded road and 170 feet west of County Road 340; approximately 1,200 feet south and 170 feet west of the northeast corner of sec. 4, T. 9 S., R. 14 E.

Ap—0 to 10 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; very friable; many fine and few medium roots; very strongly acid; clear wavy boundary.

E1—10 to 32 inches; light yellowish brown (10YR 6/4) fine sand; single grained; loose; few fine and medium roots; very strongly acid; gradual wavy boundary.

E2—32 to 42 inches; very pale brown (10YR 7/3) fine sand; few medium distinct pale brown (10YR 6/3) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

E3—42 to 51 inches; very pale brown (10YR 8/3) fine sand; single grained; loose; thin bands of sandy loam; very strongly acid; clear smooth boundary.

Bt—51 to 62 inches; light yellowish brown (10YR 6/4) sandy clay loam; weak medium subangular blocky structure; friable; extremely acid; gradual wavy boundary.

Btg—62 to 80 inches; light gray (10YR 7/1) sandy clay loam; common medium prominent very pale brown (10YR 7/4) mottles; moderate medium subangular blocky structure; friable; few fine limestone pebbles; pockets of sandy loam; extremely acid.

The thickness of the solum ranges from 60 to more than 80 inches. The depth to limestone ranges from 70 to more than 80 inches. Reaction ranges from very strongly acid to neutral in the A and E horizons and from extremely acid to moderately alkaline in the B horizon.

The A horizon has hue of 10YR, value of 4 or 5, and chroma of 2 or 3. It is fine sand or sand. It is 6 to 10 inches thick.

The AE horizon, if it occurs, has hue of 10YR, value of 4 or 5, and chroma of 3 or 4. It is 8 to 18 inches thick.

The E horizon has hue of 10YR, value of 6 to 8, and chroma of 1 to 6. It has chroma of 3 or more in some parts. In some pedons it is mottled in shades of brown or yellow. The combined content of silt and clay is less than 5 percent. This horizon is 27 to 50 inches thick. Some pedons have an E&Bt horizon of fine sand and lamellae of loamy fine sand or sandy loam.

The Bt horizon has hue of 10YR, value of 5 to 8, and chroma of 3 to 8. In some pedons it is mottled in shades of brown, yellow, or gray. This horizon is sandy loam, fine sandy loam, or sandy clay loam. It is 11 to 27 inches thick.

The Btg horizon has hue of 10YR, value of 5 to 8, and chroma of 1 or 2. In some pedons it is mottled in shades of yellow or brown. This horizon is sandy clay loam, sandy clay, or clay. It is 0 to 15 inches thick.

Pamlico Series

The Pamlico series consists of nearly level, very poorly drained, organic soils in swamps on flood plains in the flatwoods. These soils are organic to a depth of 16 to 51 inches. They formed from herbaceous plant material mixed with woody plant material. The soils are sandy or sandy-skeletal, siliceous, dysic, thermic Terric Medisaprists.

Pamlico soils are associated with Dorovan, Leon, Osier, and Surrency soils. Dorovan soils have more than 51 inches of muck. Leon, Osier, and Surrency soils are of mineral origin. Leon and Osier soils are poorly drained. Leon soils have a Bh horizon within a depth of 30 inches. Osier soils are sandy to a depth of 80 inches or more. Surrency soils have a Btg horizon at a depth of 20 to 40 inches.

Typical pedon of Pamlico muck, in an area of Pamlico-Dorovan mucks, frequently flooded;

approximately 0.1 mile west of Florida Highway 47 and 0.02 mile north of trail road; 1,940 feet north and 500 feet west of the southeast corner of sec. 26, T. 9 S., R. 15 E.

Oa1—0 to 18 inches; dark brown (7.5YR 3/2) muck; about 30 percent fiber before rubbing, 10 percent after rubbing; massive; very friable; fibers from leaves, twigs, and roots; sodium pyrophosphate color of light yellowish brown (10YR 6/4); very strongly acid; gradual wavy boundary.
Oa2—18 to 38 inches; very dark gray (10YR 3/1) muck; less than 5 percent fiber after rubbing; massive; friable; sodium pyrophosphate color of dark yellowish brown (10YR 4/4); very strongly acid; clear wavy boundary.
Cg—38 to 80 inches; grayish brown (10YR 5/2) fine sand; single grained; loose; very strongly acid.

As measured by the 0.01 molar calcium chloride procedure, reaction in the organic material is less than 4.5. As measured by the Hellige-Truog method, it is less than 5.5. The mineral horizon is extremely acid to strongly acid.

The Oa horizon has hue of 10YR or 7.5YR, value of 2 or 3, and chroma of 1 or 2, or it is neutral in hue and has value of 2 or 3. The content of fibers is 30 percent or less before rubbing and less than 10 percent after rubbing. The sodium pyrophosphate extract has hue of 10YR, value of 3 to 6, and chroma of 3 to 6. This horizon is 16 to 51 inches thick.

The Cg horizon has hue of 10YR, value of 3 to 6, and chroma of 1 or 2, or it is neutral in hue and has value of 3 to 6. It is sand or fine sand.

Penney Series

The Penney series consists of nearly level to moderately sloping, excessively drained soils in the uplands. These soils are sandy to a depth of more than 80 inches. They formed in thick beds of sandy marine deposits. The soils are thermic, uncoated Typic Quartzipsamments.

Penney soils are associated with Albany, Blanton, Kershaw, Ortega, and Wadley soils. Albany, Blanton, and Wadley soils have sandy A and E horizons that, combined, are 40 to 79 inches thick. These horizons are underlain by a loamy Bt horizon. Kershaw soils do not have lamellae. Albany soils are somewhat poorly drained, Blanton and Ortega soils are moderately well drained, and Wadley soils are well drained.

Typical pedon of Penney fine sand, 0 to 5 percent slopes; about 12 miles south of extension of State Road 341 and 800 feet east of graded road; 2,200 feet north and 2,000 feet west of the southeast corner of sec. 35, T. 8 S., R. 14 E.

A—0 to 7 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; very friable; few fine and medium roots; many uncoated sand grains; very strongly acid; clear smooth boundary.
E1—7 to 17 inches; pale brown (10YR 6/3) fine sand; brown (10YR 5/3) streaks and splotches; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.
E2—17 to 56 inches; very pale brown (10YR 7/4) fine sand; few medium distinct brown (10YR 5/3) splotches and white (10YR 8/2) sand strippings; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.
E&Bt—56 to 80 inches; very pale brown (10YR 8/3) fine sand (E); single grained; loose; many clean sand grains; yellowish brown (10YR 5/8) lamellae of loamy fine sand (B) about 3 to 6 inches long and 1/8 to 1/4 inch thick; well coated sand grains; strongly acid.

The solum is 80 or more inches thick. The combined content of silt and clay is less than 5 percent between depths of 10 and 40 inches. Thin lamellae are at a depth of 50 to 80 inches. Reaction is extremely acid to moderately acid throughout the profile.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 or 2. It is 3 to 7 inches thick.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 3 to 8. It generally has few or common fine and medium streaks that have hue of 10YR, value of 7 or 8, and chroma of 1 or 2. The color of the streaks is that of the uncoated sand grains and is not indicative of wetness. This horizon is sand or fine sand. It is 47 to 72 inches thick.

The E part of the E&B horizon has hue of 10YR, value of 5 to 8, and chroma of 3 to 8. It is sand or fine sand. It is 2 to 8 inches thick between the lamellae. In some pedons it has few or common small pockets of light gray or white, clean sand grains. The B part occurs as lamellae that have hue of 7.5YR or 10YR, value of 5 or 6, and chroma of 4 to 8. The lamellae are loamy sand, loamy fine sand, or sandy loam. They are 1/32 to 1/4 inch thick and 1/2 inch to 24 inches long. They are at a depth of 50 to 80 inches and extend to a depth of more than 80 inches, generally increasing in thickness with increasing depth.

Pottsburg Series

The Pottsburg series consists of nearly level, poorly drained soils in narrow areas between depressions in the flatwoods. These soils are sandy to a depth of more

than 80 inches. They formed in thick beds of sandy marine deposits. The soils are sandy, siliceous, thermic Grossarenic Haplaquods.

Pottsburg soils are associated with Allanton, Hurricane, Leon, Lynn Haven, and Sapelo soils. Allanton and Lynn Haven soils have a dark A horizon that is thicker than that of the Pottsburg soils. Allanton soils are very poorly drained. Lynn Haven and Sapelo soils have a Bh horizon within a depth of 30 inches. Sapelo soils have a Btg horizon below a depth of 40 inches. Hurricane soils are somewhat poorly drained. Leon soils have a Bh horizon within a depth of 30 inches.

Typical pedon of Pottsburg fine sand; about 0.5 mile north of trail 210 and 0.2 mile east of trail 61; about 2,500 feet south and 2,640 feet east of the northwest corner of sec. 29, T. 9 S., R. 16 E.

A—0 to 5 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; many fine and medium roots; very strongly acid; clear wavy boundary.

E1—5 to 28 inches; gray (10YR 6/1) fine sand; common medium distinct dark gray (10YR 4/1) streaks; single grained; loose; very strongly acid; gradual wavy boundary.

E2—28 to 63 inches; grayish brown (10YR 5/2) fine sand; few medium distinct dark gray (10YR 4/1) mottles; single grained; loose; very strongly acid; abrupt wavy boundary.

Bh1—63 to 67 inches; very dark gray (5YR 3/1) fine sand; weak fine granular structure; friable; very strongly acid; abrupt wavy boundary.

Bh2—67 to 80 inches; black (5YR 2/1) fine sand; weak fine granular structure; friable; very strongly acid.

The texture generally is fine sand or sand to a depth of 80 inches or more. Reaction ranges from extremely acid to slightly acid in the A and E horizons and from extremely acid to moderately acid in the Bh horizon.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2, or it is neutral in hue and has value of 2 to 5. It is 3 to 8 inches thick.

The E1 horizon has hue of 10YR, value of 4 to 7, and chroma of 1 to 3. It is 6 to 24 inches thick.

The E2 horizon and the E3 horizon, if it occurs, have hue of 10YR or 2.5Y, value of 5 to 8, and chroma of 1 or 2. They may have few or common mottles in shades of gray, brown, or yellow. The combined thickness of the E2 and E3 horizons is 20 to 70 inches.

The Bh horizon has hue of 5YR, value of 2 to 4, and chroma of 1 to 4; hue of 7.5YR, value of 3 to 5, and chroma of 1 to 4; or hue of 10YR, value of 2 to 5, and chroma of 1 to 4. Sand grains are well coated with organic matter and are weakly cemented in parts of the horizon. This horizon extends to a depth of more than 80 inches.

Resota Series

The Resota series consists of nearly level to moderately sloping, moderately well drained soils on high ridges on the coastal flood plains. These soils are sandy to a depth of more than 80 inches. They formed in thick beds of sandy marine deposits. The soils are thermic, uncoated Spodic Quartzipsamments.

Resota soils are associated with Elloree, Garcon, Ortega, Osier, Penney, and Ridgewood soils. Elloree and Garcon soils have a Bt horizon. Garcon and Ridgewood soils are somewhat poorly drained. Ortega soils do not have an AB horizon. Osier soils are poorly drained. Penney soils are excessively drained.

Typical pedon of Resota fine sand, 0 to 5 percent slopes, occasionally flooded; about ¾ mile east of the Suwannee River and 1 mile south of the Seaboard Coastline Railroad; 2,400 feet north and 2,300 feet west of the southeast corner of sec. 19, T. 10 S., R. 14 E.

A—0 to 5 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; very friable; many fine and medium roots; moderately acid; clear wavy boundary.

E—5 to 12 inches; light gray (10YR 7/2) fine sand; very dark gray splotches; single grained; loose; many fine and medium roots; moderately acid; clear wavy boundary.

Bw1—12 to 16 inches; brown (7.5YR 5/4) and dark yellowish brown (10YR 4/4) fine sand; common medium distinct yellowish brown (10YR 5/4) mottles; weak fine granular structure; very friable; few fine and medium roots; very friable; strongly acid; clear wavy boundary.

Bw2—16 to 26 inches; brownish yellow (10YR 6/6) fine sand; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

Bw3—26 to 55 inches; yellow (10YR 7/6) fine sand; common medium distinct strong brown (7.5YR 5/6) mottles; single grained; loose; very strongly acid; gradual wavy boundary.

C—55 to 80 inches; very pale brown (10YR 7/3) fine sand; common medium distinct yellowish brown (10YR 5/8) mottles; single grained; loose; very strongly acid.

The solum is 40 or more inches thick. The texture is sand or fine sand to a depth of 80 inches or more. Reaction ranges from extremely acid to slightly acid throughout the profile.

The A horizon has hue of 10YR, value of 4 to 6, and chroma of 1 or 2. It is 2 to 5 inches thick.

The E horizon has hue of 10YR, value 6 to 8, and chroma of 1 or 2. It is 6 to 34 inches thick.

The Bw horizon has hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 4 to 8. It is 10 to 50 inches thick.

The C horizon has hue of 10YR, value 6 to 8, and chroma of 1 to 4. It is mottled in shades of yellow, brown, or red.

Ridgewood Series

The Ridgewood series consists of nearly level and gently sloping, somewhat poorly drained soils in broad, slightly elevated areas in the flatwoods and along the lower slopes in the sandy uplands. These soils formed in beds of marine sediments 80 or more inches thick. They are thermic, uncoated Aquic Quartzipsamments.

Ridgewood soils are associated with Albany, Hurricane, Ortega, and Osier soils. Albany soils have a Bt horizon at a depth of 40 to 80 inches. Hurricane soils have a Bh horizon. Ortega soils are moderately well drained. Osier soils are poorly drained.

Typical pedon of Ridgewood fine sand, 0 to 5 percent slopes; about 167 feet north of County Road 232 and 834 feet west of trail road; 2,400 feet north and 900 feet east of the southwest corner of sec. 3, T. 9 S., R. 15 E.

Ap—0 to 6 inches; dark gray (10YR 4/1) fine sand; weak fine granular structure; very friable; many fine, medium, and large roots; very strongly acid; clear wavy boundary.

C1—6 to 25 inches; light yellowish brown (10YR 6/4) fine sand; common coarse distinct dark yellowish brown (10YR 4/4) mottles in the upper part of the horizon and few medium distinct light brownish gray (10YR 6/2) mottles in the lower part; single grained; loose; many fine and medium and few large roots; very strongly acid; gradual wavy boundary.

C2—25 to 40 inches; pale brown (10YR 6/3) and light brownish gray (10YR 6/2) fine sand; single grained; loose; few fine and medium charcoal fragments; very strongly acid; gradual wavy boundary.

C3—40 to 80 inches; light gray (10YR 7/2) fine sand; single grained; loose; few fine, medium, and large roots; few fine and medium prominent reddish yellow (7.5YR 6/8) root stains; strongly acid.

The texture is sand or fine sand to a depth of 80 inches or more. The combined content of silt and clay is less than 5 percent between depths of 10 and 40 inches. Reaction is very strongly acid to moderately acid throughout the profile.

The A horizon has hue of 10YR, value of 2 to 5, and chroma of 1 or 2, or it is neutral in hue and has value of 2 to 5. It is 4 to 9 inches thick.

The C horizon has hue of 10YR and has value of 5 to 8 and chroma of 2 to 4 or value of 4 and chroma of 3. Mottles in various shades of red, yellow, brown, or gray are within a depth of 40 inches.

Sapelo Series

The Sapelo series consists of nearly level, poorly drained soils in the flatwoods. These soils are sandy to a depth of 41 inches and are loamy in the lower part. They formed in beds of sandy and loamy marine deposits. The soils are sandy, siliceous, thermic Ultic Haplaquods.

Sapelo soils are associated with Albany, Allanton, Leon, Lynn Haven, Surrency, and Wesconnett soils. Albany soils do not have a Bh horizon. They are somewhat poorly drained. Allanton, Lynn Haven, Surrency, and Wesconnett soils are very poorly drained. Allanton soils have a thick, dark A horizon and have a Bh horizon below a depth of 51 inches. Lynn Haven soils have a thick, dark A horizon. Surrency soils have a thick, dark A horizon, do not have a Bh horizon, and have a Btg horizon at a depth of 20 to 40 inches. Wesconnett soils do not have an E horizon. Leon soils have a Bh horizon within a depth of 30 inches.

Typical pedon of Sapelo fine sand; about 1 mile north of Florida Highway 26 and 100 feet east of trail road; 1,100 feet south and 300 feet west of the northeast corner of sec. 11, T. 10 S., R. 15 E.

A—0 to 5 inches; black (10YR 2/1) fine sand; weak fine granular structure; very friable; many fine and few medium roots; strongly acid; clear wavy boundary.

E—5 to 20 inches; light brownish gray (10YR 6/2) fine sand; dark grayish brown root stains; single grained; loose; many medium and few large roots; strongly acid; abrupt wavy boundary.

Bh—20 to 25 inches; dark brown (7.5YR 3/2) fine sand; weak fine granular structure; firm; many sand grains coated with organic matter; few clean sand grains; very strongly acid; clear wavy boundary.

BE—25 to 29 inches; dark yellowish brown (10YR 4/4) fine sand; common medium distinct brown root stains; single grained; loose; very strongly acid; gradual wavy boundary.

E′—29 to 35 inches; light yellowish brown (10YR 6/4) fine sand; common medium distinct dark yellowish brown root stains; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

EB—35 to 41 inches; pale brown (10YR 6/3) loamy fine sand; moderate fine granular structure; very friable; strongly acid; gradual wavy boundary.

Btg1—41 to 67 inches; gray (10YR 6/1) fine sandy loam; many coarse prominent strong brown (7.5YR 5/6, 5/8) and common medium prominent red (2.5YR 4/6, 4/8) mottles; moderate medium subangular blocky structure; slightly sticky; very strongly acid; gradual wavy boundary.

Btg2—67 to 80 inches; grayish brown (10YR 5/2) fine sandy loam; common medium distinct yellowish brown mottles; moderate medium subangular blocky structure; slightly sticky; very strongly acid.

The solum is 80 or more inches thick. Depth to the Bh horizon is 15 to 30 inches. Depth to the argillic horizon ranges from 40 to 80 inches. Reaction is extremely acid to strongly acid throughout the profile.

The A horizon has hue of 10YR, value of 2 to 4, and chroma of 1, or it is neutral in hue and has value of 2 to 4. It is 3 to 8 inches thick.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. In some pedons it is mottled in shades of yellow or brown. This horizon is sand or fine sand. It is 7 to 22 inches thick.

The Bh horizon is neutral in hue and has value of 2; has hue of 10YR, value of 2 or 3, and chroma of 1 or 2; has hue of 10YR and value and chroma of 3; has hue of 7.5YR, value of 3, and chroma of 2; has hue of 5YR, value of 2, and chroma of 1 or 2; or has hue of 5YR, value of 3, and chroma of 2 or 3. This horizon is sand or fine sand. It is 5 to 15 inches thick.

The BE horizon, if it occurs, has hue of 10YR. It has value and chroma of 3 or 4, value of 6 and chroma of 3, value of 7 and chroma of 3 or 4, or value of 5 and chroma of 4 to 6. This horizon is sand or fine sand. It is 0 to 4 inches thick.

The E′ horizon has hue of 10YR and has value of 5 and chroma of 2 or value of 6 or 7 and chroma of 1 to 3, or it has a mixture of these colors. It is sand or fine sand.

The Btg horizon has hue of 5YR, value of 5 or 6, and chroma of 1; hue of 5YR, value of 7 or 8, and chroma of 1 or 2; hue of 10YR, value of 7 or 8, and chroma of 1 or 2; or hue of 10YR, value of 6, and chroma of 1. In some pedons it is mottled in shades of red, yellow, or brown. This horizon is sandy loam, fine sandy loam, or sandy clay loam.

Shadeville Series

The Shadeville series consists of nearly level and gently sloping, moderately well drained soils in the uplands. These soils are sandy to a depth of 20 inches or more, are loamy in the lower part, and are underlain by limestone. They formed in sandy and loamy marine deposits over limestone. The soils are loamy, siliceous, thermic Arenic Hapludalfs.

Shadeville soils are associated with Blanton, Bonneau, Otela, Penney, and Wadley soils. Blanton, Bonneau, and Wadley soils have base saturation of less than 35 percent. Blanton, Otela, and Wadley soils have a Bt horizon at a depth of 40 to 80 inches. Otela and Wadley soils are well drained. Penney soils are excessively drained. They do not have a Bt horizon.

Typical pedon of Shadeville fine sand, in an area of Shadeville-Otela fine sands, 0 to 5 percent slopes; 0.7 mile south of Florida Highway 26 and approximately 0.8 mile west of County Road 341; about 1,333 feet south and 833 feet east of the northwest corner of sec. 23, T. 10 S., R. 14 E.

Ap—0 to 9 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; few fine roots; very strongly acid; clear wavy boundary.

E1—9 to 21 inches; grayish brown (10Y 5/2) fine sand; single grained; loose; few fine clean light gray (10YR 7/2) sand grains; few fine roots; very strongly acid; clear wavy boundary.

E2—21 to 32 inches; pale brown (10YR 6/3) fine sand; few medium distinct light yellowish brown (10YR 6/4) mottles; single grained; loose; light gray (10YR 7/2) uncoated sand grains; few charcoal fragments; few fine roots; very strongly acid; abrupt wavy boundary.

Bt—32 to 38 inches; very pale brown (10YR 7/4) sandy clay loam; common medium distinct light reddish brown (5YR 6/4) mottles; weak medium subangular blocky structure; very friable; few fine roots; very strongly acid; gradual wavy boundary.

Btg—38 to 42 inches; light brownish gray (10YR 6/2) sandy clay loam; moderate medium subangular blocky structure; very friable; pockets of soft carbonatic material; slightly acid; abrupt wavy boundary.

2R—42 inches; white (10YR 8/2) limestone; can be chipped with a spade.

The solum is 40 to 72 inches thick. The depth to limestone varies greatly within short distances. In some pedons the E and Bt horizons have limestone gravel, cobbles, or stones or have chert fragments. Reaction is very strongly acid to neutral in the A, E, and Bt horizons and strongly acid to moderately alkaline in the Btg horizon.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 1 to 3. It is 3 to 9 inches thick.

The upper part of the E horizon has hue of 10YR, value of 5 to 8, and chroma of 2 to 6. The lower part has chroma of 3 to 6. Chroma of 2 is the result of leaching and is not indicative of wetness. This horizon is sand or fine sand. The combined thickness of the A and E horizons is 20 to 39 inches.

The Bt horizon has hue of 10YR or 7.5YR, value of 5 to 7, and chroma of 4 to 8. In some pedons it is mottled in shades of gray, brown, yellow, or red. The gray mottles, if they occur, are below a depth of 30 inches. This horizon is sandy loam, sandy clay loam, or sandy clay. The content of clay in the upper 20 inches of the Bt horizon averages less than 35 percent. This horizon is 5 to 51 inches thick.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2. It is mottled in shades of red, brown, or yellow. This horizon is sandy loam, sandy clay loam, sandy clay, or clay. It is 0 to 20 inches thick.

Some pedons have a 2Cr horizon. This horizon has hue of 10YR, value of 7 or 8, and chroma of 1. It is soft, powdery limestone that can be dug with a spade. It has few to many gravel- and cobble-sized, hard limestone or chert fragments.

The 2R horizon is hard, white limestone bedrock that can be chipped with a spade. It has a smooth to irregular surface.

Surrency Series

The Surrency series consists of nearly level, very poorly drained soils in wet depressional areas in the flatwoods. These soils formed in beds of loamy marine deposits. They are loamy, siliceous, thermic Arenic Umbric Paleaquults.

Surrency soils are associated with Leon, Meggett, and Sapelo soils. Leon and Sapelo soils are poorly drained. They have a Bh horizon within a depth of 30 inches. Sapelo soils have a Btg horizon at a depth of 40 to 80 inches. Meggett soils have a Btg horizon within a depth of 20 inches.

Typical pedon of Surrency mucky fine sand, depressional; about 1,400 feet south of Florida Highway 26 and 700 feet west of paved road; 2,000 feet south and 1,800 feet east of the northwest corner of sec. 13, T. 10 S., R. 15 E.

A1—0 to 12 inches; very dark brown (10YR 2/2) mucky fine sand; moderate medium granular structure; very friable; many fine and medium tree roots; few uncoated sand grains; very strongly acid; gradual wavy boundary.

A2—12 to 16 inches; very dark gray (10YR 3/1) fine sand; weak fine granular structure; very friable; few fine and medium roots; few uncoated sand grains; very strongly acid; clear wavy boundary.

Eg—16 to 34 inches; grayish brown (10YR 5/2) fine sand; common fine faint light brownish gray mottles; single grained; loose; few fine and medium roots; very strongly acid; gradual wavy boundary.

Btg1—34 to 48 inches; gray (5Y 5/1) sandy clay loam; common medium prominent olive brown (2.5Y 4/4) mottles; weak medium subangular blocky structure; friable; few clay films on faces of peds; very strongly acid; gradual wavy boundary.

Btg2—48 to 80 inches; gray (5Y 6/1) sandy clay loam; common medium distinct olive (5Y 5/3) and common medium distinct light yellowish brown (2.5Y 6/4) mottles; weak medium subangular blocky structure; friable; few clay films on faces of peds; strongly acid.

The solum is 60 or more inches thick. Reaction is extremely acid to strongly acid throughout the profile.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2, or it is neutral in hue and has value of 2 or 3. It is 10 to 18 inches thick.

The Eg horizon has hue of 10YR and has value of 4 to 6 and chroma of 2 or value of 7 and chroma of 1 or 2. In some pedons it is mottled in shades of yellow or brown. This horizon is fine sand or sand. It is 10 to 24 inches thick.

The Btg horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2 or hue of 5Y, value of 5 or 6, and chroma of 1. It is mottled in shades of yellow, olive, brown, or red. This horizon is sandy loam or sandy clay loam.

Wadley Series

The Wadley series consists of nearly level and gently sloping, well drained soils in the uplands. These soils are sandy to a depth of 40 to 79 inches and are loamy in the lower part. They formed in thick beds of sandy and loamy marine deposits. The soils are loamy, siliceous, thermic Grossarenic Paleudults.

Wadley soils are associated with Albany, Blanton, Otela, and Penney soils. Albany soils are somewhat poorly drained. Blanton soils are moderately well drained. Otela soils are underlain by soft limestone. Penney soils are sandy to a depth of more than 80 inches.

Typical pedon of Wadley fine sand, 0 to 5 percent slopes; about 0.3 mile south of County Road 344 and 0.1 mile west of County Road 232; about 2,500 feet south and 300 feet west of the northeast corner of sec. 32, T. 9 S., R. 14 E.

Ap—0 to 8 inches; dark grayish brown (10YR 4/2) fine sand; weak fine granular structure; very friable; many fine roots; very strongly acid; gradual wavy boundary.

E1—8 to 19 inches; pale brown (10YR 6/3) fine sand; single grained; loose; few fine roots; strongly acid; gradual wavy boundary.

E2—19 to 35 inches; brownish yellow (10YR 7/6) fine sand; single grained; loose; strongly acid; gradual wavy boundary.
E3—35 to 43 inches; very pale brown (10YR 7/4) fine sand; single grained; loose; strongly acid; clear wavy boundary.
Bt1—43 to 58 inches; strong brown (7.5YR 5/6) sandy clay loam; weak medium subangular blocky structure; friable; strongly acid; gradual wavy boundary.
Bt2—58 to 72 inches; strong brown (7.5YR 5/8) sandy clay loam; weak medium subangular blocky structure; friable; strongly acid; gradual wavy boundary.
Bt3—72 to 80 inches; light yellowish brown (10YR 6/4) sandy loam; weak medium subangular blocky structure; very friable; common medium-sized bodies of pale brown (10YR 6/3) uncoated sand grains; strongly acid.

The solum is more than 80 inches thick. Reaction ranges from very strongly acid to moderately acid throughout the profile.

The A horizon has hue of 10YR, value of 3 to 5, and chroma of 2 to 4. It is 4 to 9 inches thick.

The E horizon has hue of 10YR, value of 5 to 8, and chroma of 3 to 8. It is sand or fine sand. In most pedons it has few or common uncoated sand grains. This horizon is 31 to 74 inches thick.

The Bt horizon has hue of 5YR to 10YR, value of 5 to 7, and chroma of 4 to 8. It is sandy loam, fine sandy loam, or sandy clay loam.

Wesconnett Series

The Wesconnett series consists of nearly level, very poorly drained soils in shallow depressions and poorly defined drainageways in the flatwoods. These soils are sandy to a depth of more than 80 inches. They formed in thick beds of sandy marine deposits. The soils are sandy, siliceous, thermic Typic Haplaquods.

Wesconnett soils are associated with Allanton, Hurricane, Leon, Lynn Haven, Pamlico, Pottsburg, and Ridgewood soils. Allanton, Hurricane, Leon, Lynn Haven, and Pottsburg soils have a continuous E horizon. Allanton, Hurricane, and Pottsburg soils have a Bh horizon below a depth of 50 inches. Hurricane soils are somewhat poorly drained. Pamlico soils are muck in the upper 16 to 38 inches. Ridgewood soils do not have a Bh horizon. They are somewhat poorly drained.

Typical pedon of Wesconnett mucky fine sand, depressional; about 1,300 feet north of abandoned railroad and 1,600 feet west of trail road; 1,300 feet north and 1,000 feet west of the southeast corner of sec. 31, T. 9 S., R. 16 E.

A—0 to 8 inches; black (10YR 2/1) mucky fine sand; weak fine crumb structure; very friable; common fine and medium roots; very strongly acid; gradual wavy boundary.
Bh—8 to 28 inches; very dark brown (10YR 2/2) fine sand; weak fine granular structure; friable; sand grains coated with organic matter; very strongly acid; gradual wavy boundary.
E1—28 to 41 inches; dark brown (10YR 4/3) fine sand; single grained; loose; very strongly acid; gradual wavy boundary.
E2—41 to 52 inches; brown (10YR 5/3) fine sand; single grained; loose; very strongly acid; clear wavy boundary.
B'h—52 to 80 inches; black (10YR 2/1) fine sand; weak fine granular structure; friable; sand grains coated with organic matter; very strongly acid.

The solum is 80 or more inches thick. Reaction is very strongly acid or strongly acid throughout the profile.

The A horizon has hue of 10YR, value of 2, and chroma of 1 or 2, or it is neutral in hue and has value of 2. It is 6 to 14 inches thick.

The Bh horizon has hue of 10YR or 5YR, value of 2 or 3, and chroma of 1 or 2. Sand grains are well coated with organic matter and are weakly cemented in parts of the horizon. This horizon is sand or fine sand. It is 15 to 23 inches thick.

The E horizon has hue of 10YR, value of 4 to 7, and chroma of 2 or 3. It is sand or fine sand. It is 10 to 32 inches thick.

The B'h horizon has the same colors and textures as the Bh horizon.

Formation of the Soils

In this section the factors of soil formation are related to the soils in Gilchrist County. In addition, the processes of soil formation are described.

Factors of Soil Formation

Soil forms when parent material, climate, relief, plants and animals, and time interact. These five factors determine the nature of the soil and affect the formation of each soil. The relative importance of each factor differs from place to place. In some areas one factor may dominate the formation of a soil and determine most of the soil properties. For example, if the parent material is pure quartz sand, which is highly resistant to weathering, the soil generally has faint horizons. A distinct profile can form in such a soil if the vegetation is of a certain type, relief is low and flat, and the water table is high.

Parent Material

Parent material is the unconsolidated mass in which a soil forms. It determines the chemical and mineral composition of a soil. In Gilchrist County the parent material is sandy or loamy marine sediment. Differences in parent material within the county are mainly the result of the way the sand, silt, and clay were sorted and deposited by the ocean and streams of the Pleistocene Epoch.

Most of the soils in Gilchrist County formed in several lower marine and estuarine terrace deposits. Sapelo soils, for example, formed in these deposits. Soils along the Suwannee River and in parts of northern Gilchrist County are underlain by coarse clastics and by formations of the Alum Bluff Group. Albany, Blanton, and Ridgewood are the major soils in these areas. The extreme northeast part of the county is underlain by Chiefland Limestone and by formations of the Ocala Group. Alpin and Otela soils formed in this area.

Climate

Climate, particularly temperature and rainfall, largely determines the rate and nature of the physical, chemical, and biological processes that affect the weathering of soil material. Rainfall, changing temperatures, wind, and sunlight help to advance the breakdown of rocks and minerals, the release of chemicals, and other processes that affect the formation of soils. The amount of water that percolates through the soil depends on rainfall, relative humidity, permeability of the soil, and physiographic position. Temperature influences the kinds of organisms and their growth and the speed of physical and chemical reactions in the soils.

Gilchrist County has a warm, humid climate characterized by long, hot summers and short, mild winters. The soils are generally low in content of bases because most of the rainfall percolates downward through the profile. Because rainfall is generally well distributed, most of the soils are moist most of the year. The climate is uniform throughout the county and has had about the same effect on soil formation in all parts of the county. Most of the soils are highly weathered, leached, strongly acid, and low in natural fertility and in organic matter.

Relief

Relief has affected the formation of soils in Gilchrist County mainly through its influence on soil-water relationships and through its effect on erosion. Other factors of soil formation that are generally associated with relief, such as temperature and plant cover, are of minor importance.

The soils in the county generally are in areas of flatwoods, broad swamps, sandhills, rolling uplands, and flood plains. Differences among the soils in these areas are directly related to relief. The soils in the swamps and flatwoods have a high water table and are periodically wet at the surface. They are not so highly leached as the soils on the sandhills and the rolling uplands. The soils on the sandhills, such as Penney soils, are deep and sandy and are subject to drought. The soils on the rolling uplands, such as Bonneau soils, are mostly loamy and are subject to erosion. The soils on flood plains, such as Fluvaquents, are subject to flooding and prolonged wetness.

The most prominent example of how relief affects soil

formation is on the Waccasassa Flats. Water on these flats drains into large depressions that have few or no outlets and have a water table at or above the surface most of the time. This prolonged saturation and the partly decomposed organic matter prevent rapid oxidation and weathering of the soil material.

Plants and Animals

Plants, animals, bacteria, and other organisms are active in the soil-forming processes. The changes they bring about depend on the kinds of life processes peculiar to each. The kinds of plants and animals that live on and in the soil are affected, in turn, by climate, parent material, relief, and age of the soil.

Plants provide a cover that helps to control erosion and stabilizes the surface so that the soil-forming processes can continue. In forested areas the leaves, twigs, roots, and entire plants that accumulate on the surface and in the soil are decomposed by percolating water, microorganisms, earthworms, and other forms of life.

Small animals, earthworms, insects, and micro-organisms also influence the formation of soils by mixing organic matter into the soil and by breaking down plant residue. Small animals burrow into the soils and thus mix the layers. Earthworms and other small invertebrates feed on the organic matter in the upper few inches of the soil. They slowly but continuously mix the soil material and alter it chemically in places. Bacteria, fungi, and other micro-organisms hasten the weathering of rocks and the decomposition of organic matter.

Time

Time is an important factor of soil formation. The physical and chemical changes brought about by climate, living organisms, and relief occur at a slow rate. The length of time needed to convert raw geologic material into soil varies, depending on the nature of the geologic material and the influence of the other factors. Some of the minerals in which soils form weather fairly rapidly, but others are chemically inert and show little evidence of change over long periods. The translocation of fine particles, which results in the formation of horizons, varies under different conditions but always takes a relatively long time.

The dominant geological materials in Gilchrist County are inactive. The sand is almost pure quartz and is highly resistant to weathering. The finer textured silt and clay are the products of earlier weathering. Limestone is the only material in the county that erodes at a relatively fast rate, resulting in the formation of sinkholes.

Relatively little geological time has elapsed since the soil material in the county was laid down by the sea. Loamy and clayey horizons formed in place through the process of clay translocation. Coherent subsurface layers stained by organic matter formed in place where surface organic matter and minerals were leached through the soils and settled at a point of equilibrium.

Processes of Soil Formation

Soil morphology refers to the process involved in the formation of soil horizons, or horizon differentiation. The differentiation of horizons in soils in Gilchrist County is the result of the accumulation of organic matter, the leaching of carbonates, the reduction and transfer of iron, the accumulation of silicate clay minerals, or a combination of these processes.

Some organic matter has accumulated in the upper part of most of the soils, resulting in the formation of an A horizon. The content of organic matter is low in some of the soils and high in others.

The leaching of carbonates and salts has occurred in nearly all of the soils. The effects of this process have been indirect because leaching permitted the subsequent translocation of silicate clay in some soils. Most of the soils in the county are leached to varying degrees.

Gleying, or the reduction and transfer of iron, has occurred in most of the soils in the county, except for the organic soils. In the lower horizons of some of the wet soils, the segregation of iron has resulted in the formation of reddish brown mottles and concretions.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

AC soil. A soil having only an A and a C horizon. Commonly, such soil formed in recent alluvium or on steep rocky slopes.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 40-inch profile or to a limiting layer is expressed as:

Very low	0 to 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	more than 5.2

Base saturation. The degree to which material having cation-exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity but is more precise in meaning.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Conservation tillage. A tillage and planting system in which crop residue covers at least 30 percent of the soil surface after planting. Where soil erosion by wind is the main concern, the system leaves

the equivalent of at least 1,000 pounds per acre of flat small-grain residue on the surface during the critical erosion period.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard; little affected by moistening.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Depression. An area that is lower in elevation than the surrounding area and that is ponded for several months or more during most years.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:

Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum or periodically receive high rainfall, or both.

Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic

crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of human or animal activities or of a catastrophe in nature, for example, fire, that exposes the surface.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, or clay.

Flatwoods. Broad, nearly level areas of poorly drained soils that have characteristic vegetation of open pine forest and an understory of saw palmetto and gallberry.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Forb. Any herbaceous plant not a grass or a sedge.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as accumulation of clay, sesquioxides, humus, or a combination of these; granular, prismatic, or blocky structure; redder or browner colors than those in the A horizon; or a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake, in inches per hour, is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are:

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay

particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, or fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, or silty clay loam.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and *many*; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent.* The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with hue of 10YR, value of 6, and chroma of 4.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan.*

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material.)

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil, adversely affecting the specified use.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can

be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poor filter (in tables). Because of rapid permeability, the soil may not adequately filter effluent from a waste disposal system.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degrees of acidity or alkalinity, expressed as pH values, are:

Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Muck has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical

distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes, in millimeters, of separates recognized in the United States are as follows:

Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to soil blowing and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. *Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from soil blowing and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Technically, the E horizon. Generally refers to a leached horizon lighter in color and lower in organic matter content than the overlying surface layer.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Weathering. All physical and chemical changes

produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically a sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-80 at Gainesville, Florida]

Month	Temperature			Precipitation		
	Monthly mean	Monthly maximum mean	Monthly minimum mean	Monthly mean	Extreme high	Extreme low
	°F	°F	°F	In	In	In
January	56.1	68.3	43.8	3.27	8.87	0.25
February	57.8	70.6	44.9	3.91	7.92	1.05
March	63.6	76.6	50.6	3.67	10.48	.84
April	69.9	82.9	56.9	2.94	8.43	.18
May	75.5	87.8	63.1	4.18	9.25	.46
June	79.9	90.4	68.8	6.63	15.74	2.26
July	81.3	91.4	71.1	7.09	10.86	1.44
August	81.3	91.4	71.1	7.09	14.15	2.84
September	79.3	89.1	69.5	5.60	13.04	.25
October	71.5	82.7	60.2	2.33	6.12	.11
November	63.5	85.7	51.2	2.04	7.27	*
December	57.8	70.1	45.5	3.19	7.62	.02
Annual mean	69.7	---	---	52.84	---	---

* Trace.

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-80 at Gainesville, Florida]

Probability	Temperature		
	24 °F or lower	28 °F or lower	32 °F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	Feb. 7	Mar. 2	Mar. 19
2 years in 10 later than--	Jan. 30	Feb. 19	Mar. 13
5 years in 10 later than--	Jan. 12	Jan. 27	Feb. 24
First freezing temperature in fall:			
1 year in 10 earlier than--	Nov. 22	Nov. 17	Nov. 10
2 years in 10 earlier than--	Dec. 17	Nov. 25	Nov. 17
5 years in 10 earlier than--	Dec. 27	Dec. 11	Dec. 5

TABLE 3.--RATINGS OF GENERAL SOIL MAP UNITS FOR SPECIFIED USES

[The overall rating for the map unit is based on the dominant soils]

Map unit	Extent of area	Limitations for-- Crops	Limitations for-- Pasture	Potential productivity for planted pines	Limitations for-- Sanitary facilities*	Limitations for-- Building site development**	Limitations for-- Recreational areas***
	Pct						
1. Alpin-Wadley	6	Very severe: droughty, rapid leaching.	Moderate: droughty, low fertility.	High: equipment limitation, seedling mortality, plant competition.	Severe: seepage, too sandy.	Slight	Severe: too sandy.
2. Penney-Kershaw	38	Very severe: droughty, rapid leaching.	Moderate: droughty, low fertility.	Moderate: equipment limitation, seedling mortality.	Severe: seepage, too sandy.	Slight	Severe: too sandy.
3. Bonneau-Blanton-Eunola	4	Moderate: droughty, rapid leaching, wetness.	Slight	High: equipment limitation, seedling mortality, plant competition.	Moderate: wetness.	Slight	Severe: too sandy, wetness.
4. Penney-Otela	15	Very severe: droughty, rapid leaching.	Moderate: droughty, low fertility.	Moderate: equipment limitation, seedling mortality, plant competition.	Severe: wetness, seepage, too sandy.	Slight	Severe: too sandy.
5. Wadley-Blanton	3	Severe: droughty, rapid leaching.	Moderate: droughty, low fertility.	High: equipment limitation, seedling mortality, plant competition.	Moderate: wetness.	Slight	Severe: too sandy.
6. Lynn Haven-Ridgewood	10	Very severe: wetness, ponding, droughty.	Severe: wetness, ponding, droughty.	Moderate: equipment limitation, seedling mortality, plant competition.	Severe: wetness, ponding.	Severe: wetness, ponding.	Severe: wetmess, ponding, too sandy.
7. Ortega-Ridgewood	8	Severe: droughty, rapid leaching, wetness.	Moderate: droughty, wetness.	Moderately high: equipment limitation, seedling mortality, plant competition.	Severe: wetness.	Severe: wetness.	Severe: too sandy, wetness.
8. Wesconnett-Lynn Haven-Ridgewood	7	Very severe: wetness, ponding, droughty.	Very severe: wetness, ponding, droughty.	Low: equipment limitation, seedling mortality, plant competition.	Severe: wetness, ponding.	Severe: wetness, ponding.	Severe: wetness, ponding.

See footnotes at end of table.

TABLE 3.--RATINGS OF GENERAL SOIL MAP UNITS FOR SPECIFIED USES--Continued

Map unit	Extent of area	Limitations for--		Potential productivity for planted pines	Limitations for--		
		Crops	Pasture		Sanitary facilities*	Building site development**	Recreational areas***
	Pct						
9. Leon-Wesconnett-Sapelo-------------	5	Severe: wetness, droughty, ponding.	Moderate: wetness, ponding.	Moderate: equipment limitation, seedling mortality, plant competition.	Severe: wetness, ponding.	Severe: wetness, ponding.	Severe: wetness, ponding.
10. Garcon-Elloree-Osier-Fluvaquents--	3	Very severe: wetness, flooding.	Severe: wetness, flooding.	Low: equipment limitation, seedling mortality, plant competition.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.
11. Fluvaquents-Elloree------------	1	Very severe: wetness, flooding.	Very severe: wetness, flooding.	Low: equipment limitation, seedling mortality, plant competition.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.

* Ratings apply to septic tank absorption fields and trench sanitary landfills. Alpin, Kershaw, and Penney soils have slight limitations as sites for septic tank absorption fields unless poor filtration is determined to be a hazard in high-density areas.

** Ratings apply to dwellings without basements, small commercial buildings, and local roads and streets.

*** Ratings apply to camp areas, picnic areas, and playgrounds.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
2	Penney fine sand, 0 to 5 percent slopes	53,118	23.5
3	Penney fine sand, 5 to 8 percent slopes	6,778	3.0
4	Otela-Penney fine sands, 0 to 5 percent slopes	27,131	12.0
5	Resota fine sand, 0 to 5 percent slopes, occasionally flooded	613	0.3
6	Ridgewood fine sand, 0 to 5 percent slopes	17,505	7.7
7	Leon fine sand	7,579	3.3
8	Lynn Haven and Allanton mucky fine sands, depressional	14,463	6.4
9	Hurricane fine sand, 0 to 5 percent slopes	6,062	2.7
10	Garcon fine sand, 0 to 5 percent slopes, occasionally flooded	2,394	1.0
11	Ortega fine sand, 0 to 5 percent slopes	9,181	4.1
12	Albany fine sand, 0 to 5 percent slopes	4,932	2.2
13	Wadley fine sand, 0 to 5 percent slopes	4,175	1.8
14	Pottsburg fine sand	537	0.2
15	Blanton fine sand, 0 to 5 percent slopes	4,744	2.0
16	Elloree-Osier-Fluvaquents complex, frequently flooded	3,811	1.7
18	Kershaw fine sand, gently rolling	9,834	4.3
19	Sapelo fine sand	1,306	0.6
20	Pamlico-Dorovan mucks, frequently flooded	3,842	1.7
21	Bonneau fine sand, 0 to 5 percent slopes	2,844	1.3
22	Mandarin fine sand	823	0.4
24	Quartzipsamments, excavated	1,292	0.6
25	Wesconnett mucky fine sand, depressional	7,600	3.4
26	Surrency mucky fine sand, depressional	951	0.4
27	Leon fine sand, frequently flooded	1,770	0.8
29	Shadeville-Otela fine sands, 0 to 5 percent slopes	8,215	3.6
30	Fluvaquents, frequently flooded	1,280	0.6
32	Meggett fine sand, frequently flooded	1,002	0.4
33	Eunola-Bonneau fine sands, 0 to 5 percent slopes	3,885	1.7
34	Bonneau-Blanton fine sands, 0 to 5 percent slopes	4,799	2.1
35	Alpin fine sand, 0 to 5 percent slopes	11,932	5.3
	Water areas less than 40 acres in size	2,015	0.9
	Total	226,413	100.0

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE

[Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil]

Map symbol and soil name	Land capability	Tobacco	Corn	Soybeans	Watermelons	Peanuts	Bahiagrass
		Lbs	Bu	Bu	Tons	Lbs	AUM*
2--------------- Penney	IVs	2,000	35	20	10	1,700	6.5
3--------------- Penney	VIs	---	---	---	---	---	6.5
4---------------		2,000	60	33	10	3,500	7.0
Otela----------	IIIs						
Penney---------	IVs						
5--------------- Resota	VIs	---	---	---	---	---	5.0
6--------------- Ridgewood	IVs	2,000	50	20	6	2,200	7.0
7--------------- Leon	IVw	1,500	50	33	8	---	7.5
8--------------- Lynn Haven and Allanton	VIIw	---	---	---	---	---	---
9--------------- Hurricane	IIIw	---	65	20	6	---	7.0
10-------------- Garcon	IIIw	---	---	---	---	---	6.5
11-------------- Ortega	IIIs	2,000	60	33	10	3,500	6.0
12-------------- Albany	IIIe	2,000	75	20	---	1,700	6.5
13-------------- Wadley	IIIs	3,200	60	33	10	3,500	7.0
14-------------- Pottsburg	IVw	1,500	50	33	8	---	7.0
15-------------- Blanton	IIIs	2,000	60	25	10	3,500	8.0
16-------------- Elloree-Osier-Fluvaquents	VIw	---	---	---	---	---	---
18-------------- Kershaw	VIIs	---	---	---	---	---	3.5
19-------------- Sapelo	IVw	1,500	50	20	8	---	7.5
20-------------- Pamlico-Dorovan	VIIw	---	---	---	---	---	---

See footnote at end of table.

TABLE 5.--LAND CAPABILITY AND YIELDS PER ACRE OF CROPS AND PASTURE--Continued

Map symbol and soil name	Land capability	Tobacco	Corn	Soybeans	Watermelons	Peanuts	Bahiagrass
		Lbs	Bu	Bu	Tons	Lbs	AUM*
21--------------- Bonneau	IIs	2,600	85	33	10	3,500	8.0
22--------------- Mandarin	VIs	---	---	---	---	---	6.0
24. Quartzipsamments							
25--------------- Wesconnett	VIIw	---	---	---	---	---	---
26--------------- Surrency	VIw	---	---	---	---	---	---
27--------------- Leon	VIw	---	---	---	---	---	7.5
29---------------		---	60	33	8	3,500	7.0
Shadeville-----	IIs						
Otela----------	IIIs						
30--------------- Fluvaquents	VIIw	---	---	---	---	---	---
32--------------- Meggett	VIw	---	---	---	---	---	---
33---------------		---	100	35	---	---	8.0
Eunola---------	IIw						
Bonneau--------	IIs						
34---------------		2,400	75	33	---	2,600	7.5
Bonneau--------	IIs						
Blanton--------	IIIs						
35--------------- Alpin	IVs	2,000	40	---	10	2,000	7.0

* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Map symbol and soil name	Ordination symbol	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Trees to plant
2, 3-------------- Penney	8S	Moderate	Moderate	Moderate	Slash pine----------	70	120	Sand pine, slash pine, longleaf pine.
					Longleaf pine-------	60	56	
					Sand pine-----------	75	63	
					Turkey oak----------	---	---	
					Bluejack oak--------	---	---	
					Post oak------------	---	---	
					Live oak------------	---	---	
4:								
Otela-------------	10S	Moderate	Severe	Moderate	Slash pine----------	80	143	Slash pine, longleaf pine, loblolly pine.
					Longleaf pine-------	80	56	
					Loblolly pine-------	70	93	
					Live oak------------	---	---	
					Laurel oak----------	---	---	
					Southern redcedar---	---	---	
					Turkey oak----------	---	---	
Penney------------	8S	Moderate	Moderate	Moderate	Slash pine----------	70	120	Sand pine, slash pine, longleaf pine.
					Longleaf pine-------	60	56	
					Sand pine-----------	75	63	
					Turkey oak----------	---	---	
					Bluejack oak--------	---	---	
					Post oak------------	---	---	
					Live oak------------	---	---	
5----------------- Resota	8S	Moderate	Severe	Moderate	Slash pine----------	70	120	Slash pine, longleaf pine.
					Longleaf pine-------	65	67	
					Sand pine-----------	60	42	
					Sand live oak-------	---	---	
					Turkey oak----------	---	---	
6----------------- Ridgewood	10W	Moderate	Moderate	Moderate	Slash pine----------	80	143	Slash pine, longleaf pine.
					Longleaf pine-------	65	67	
					Laurel oak----------	---	---	
					Live oak------------	---	---	
					Water oak-----------	---	---	
					Turkey oak----------	---	---	
7----------------- Leon	11W	Moderate	Moderate	Moderate	Slash pine----------	85	153	Slash pine.
					Longleaf pine-------	65	67	
8:								
Lynn Haven--------	7W	Severe	Severe	Severe	Pondcypress---------	75	25	**
					Baldcypress---------	---	---	
					Blackgum------------	---	---	
					Sweetbay------------	---	---	
					Red maple-----------	---	---	
					Swamp tupelo--------	---	---	
					Pond pine-----------	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Trees to plant
8:								
Allanton	2W	Severe	Severe	Severe	Pondcypress	75	25	**
					Baldcypress	---	---	
					Blackgum	---	---	
					Sweetbay	---	---	
					Red maple	---	---	
					Swamp tupelo	---	---	
					Pond pine	---	---	
9. Hurricane	11W	Moderate	Moderate	Moderate	Slash pine	90	163	Slash pine, longleaf pine.
					Longleaf pine	75	90	
					Bluejack oak	---	---	
					Post oak	---	---	
10. Garcon	10W	Slight	Moderate	Moderate	Slash pine	80	143	Slash pine.
					Longleaf pine	70	79	
					Water oak	---	---	
					Live oak	---	---	
					Sweetgum	---	---	
					Laurel oak	---	---	
11. Ortega	10S	Moderate	Moderate	Moderate	Slash pine	80	143	Slash pine, longleaf pine.
					Longleaf pine	70	79	
					Loblolly pine	80	110	
					Live oak	---	---	
					Post oak	---	---	
					Turkey oak	---	---	
					Laurel oak	---	---	
					Water oak	---	---	
12. Albany	11W	Moderate	Moderate	Moderate	Slash pine	85	153	Loblolly pine, slash pine, longleaf pine.
					Loblolly pine	95	142	
					Longleaf pine	80	100	
					Laurel oak	---	---	
					Sweetgum	---	---	
					Water oak	---	---	
					Live oak	---	---	
13. Wadley	11S	Moderate	Moderate	Moderate	Slash pine	84	151	Loblolly pine, longleaf pine, slash pine.
					Loblolly pine	80	110	
					Longleaf pine	75	90	
					Post oak	---	---	
					Live oak	---	---	
					Laurel oak	---	---	
14. Pottsburg	8W	Moderate	Moderate	Moderate	Slash pine	70	120	Slash pine, longleaf pine.
					Longleaf pine	60	56	
					Live oak	---	---	
					Water oak	---	---	
15. Blanton	11S	Moderate	Moderate	Moderate	Slash pine	90	163	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine	80	110	
					Longleaf pine	70	79	
					Water oak	---	---	
					Post oak	---	---	
					Live oak	---	---	
					Laurel oak	---	---	
					Sweetgum	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Trees to plant
16:								
Elloree	11W	Severe	Severe	Severe	Slash pine	90	163	**
					Loblolly pine	90	131	
					Sweetgum	---	---	
					Red maple	---	---	
					Water oak	---	---	
					Baldcypress	---	---	
Osier	11W	Severe	Severe	Severe	Slash pine	85	153	**
					Loblolly pine	87	125	
					Longleaf pine	69	77	
Fluvaquents		Severe	Severe	Severe	Slash pine	90	163	**
					Loblolly pine	90	131	
					Sweetgum	---	---	
					Red maple	---	---	
					Water oak	---	---	
					Baldcypress	---	---	
18 Kershaw	8S	Moderate	Severe	Slight	Slash pine	65	107	Sand pine, slash pine, longleaf pine.
					Longleaf pine	55	42	
					Bluejack oak	---	---	
					Blackjack oak	---	---	
					Turkey oak	---	---	
					Sand live oak	---	---	
19 Sapelo	10W	Moderate	Moderate	Moderate	Slash pine	77	136	Loblolly pine, slash pine.
					Loblolly pine	77	105	
					Longleaf pine	65	67	
20:								
Pamlico	2W	Severe	Severe	Severe	Pondcypress	75	25	**
					Baldcypress	---	---	
					Swamp tupelo	---	---	
					Red maple	---	---	
Dorovan	2W	Severe	Severe	Severe	Pondcypress	75	25	**
					Baldcypress	---	---	
					Swamp tupelo	---	---	
					Red maple	---	---	
21 Bonneau	11S	Moderate	Moderate	Moderate	Slash pine	86	155	Loblolly pine, slash pine, longleaf pine.
					Loblolly pine	86	123	
					Longleaf pine	75	90	
					Live oak	---	---	
					Hickory	---	---	
					Post oak	---	---	
					Laurel oak	---	---	
					Water oak	---	---	
22 Mandarin	8S	Moderate	Severe	Moderate	Slash pine	70	120	Slash pine, longleaf pine.
					Longleaf pine	60	56	
					Live oak	---	---	
					Post oak	---	---	
					Water oak	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Trees to plant
25: Wesconnett	2W	Severe	Severe	Severe	Pondcypress	75	25	**
					Baldcypress	---	---	
					Sweetbay	---	---	
					Blackgum	---	---	
					Carolina ash	---	---	
					Red maple	---	---	
26: Surrency	2W	Severe	Severe	Severe	Pondcypress	75	25	**
					Slash pine	90	163	
					Loblolly pine	95	142	
					Sweetgum	90	---	
					Blackgum	---	---	
					Water oak	---	---	
					Water tupelo	---	---	
27: Leon	8W	Moderate	Moderate	Moderate	Slash pine	70	120	Slash pine.
					Longleaf pine	65	67	
					Live oak	---	---	
					Water oak	---	---	
29: Shadeville	11S	Moderate	Moderate	Moderate	Slash pine	85	153	Slash pine, loblolly pine, longleaf pine.
					Longleaf pine	65	67	
					Live oak	---	---	
					Laurel oak	---	---	
					Hickory	---	---	
					Cabbage palm	---	---	
Otela	10S	Moderate	Severe	Moderate	Slash pine	80	143	Slash pine, longleaf pine.
					Longleaf pine	80	100	
					Live oak	---	---	
					Black cherry	---	---	
					Southern redcedar	---	---	
					Turkey oak	---	---	
32: Meggett	13W	Severe	Severe	Severe	Slash pine	100	183	**
					Loblolly pine	100	154	
					Water oak	---	---	
					Sweetgum	---	---	
					Blackgum	---	---	
					Red maple	---	---	
33: Eunola	11W	Moderate	Slight	Moderate	Slash pine	90	163	Loblolly pine, slash pine, longleaf pine.
					Loblolly pine	90	131	
					Longleaf pine	80	100	
					Sweetgum	---	---	
					Water oak	---	---	
					Yellow poplar	---	---	
Bonneau	11S	Moderate	Moderate	Moderate	Slash pine	86	155	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine	86	123	
					Longleaf pine	75	90	
					Live oak	---	---	
					Hickory	---	---	
					Post oak	---	---	
					Laurel oak	---	---	

See footnotes at end of table.

TABLE 6.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Map symbol and soil name	Ordination symbol	Management concerns: Equipment limitation	Management concerns: Seedling mortality	Management concerns: Plant competition	Potential productivity: Common trees	Potential productivity: Site index	Potential productivity: Volume*	Trees to plant
34:								
Bonneau-----------	11S	Moderate	Moderate	Moderate	Slash pine----------	86	155	Loblolly pine, slash pine, longleaf pine.
					Loblolly pine-------	86	123	
					Longleaf pine-------	75	90	
					Live oak------------	---	---	
					Hickory-------------	---	---	
					Post oak------------	---	---	
					Laurel oak----------	---	---	
Blanton-----------	11S	Moderate	Moderate	Moderate	Slash pine----------	90	163	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine-------	80	110	
					Longleaf pine-------	70	79	
					Water oak-----------	---	---	
					Post oak------------	---	---	
					Live oak------------	---	---	
					Laurel oak----------	---	---	
					Sweetgum------------	---	---	
35----------------- Alpin	11S	Moderate	Moderate	Slight	Slash pine----------	90	163	Slash pine, loblolly pine, longleaf pine.
					Loblolly pine-------	85	120	
					Longleaf pine-------	70	79	
					Turkey oak----------	---	---	
					Post oak------------	---	---	
					Blackjack oak-------	---	---	
					Bluejack oak--------	---	---	

* Volume is the yield in cubic feet per acre per year calculated at the age of culmination of mean annual increment for fully stocked natural stands.

** Trees to plant are not given for this soil because of the equipment limitation and other management concerns. Natural vegetation is preferred.

TABLE 7.--GRAZEABLE WOODLAND PRODUCTIVITY

[Only the soils used for grazeable woodland are listed]

Map symbol and soil name	Site name	Average annual forage production of a site in excellent condition	Desirable native forage
		Lb/acre	
2------------------------ Penney	Longleaf Pine-Turkey Oak Hills---------	3,000	Indiangrass, beaked panicum.
6------------------------ Ridgewood	Upland Hardwood Hammocks---------------	2,000	Switchgrass, longleaf uniola, purpletop, bluestems.
7------------------------ Leon	North Florida Flatwoods----------------	5,000	Creeping bluestem.
9------------------------ Hurricane	North Florida Flatwoods----------------	5,000	Indiangrass.
11----------------------- Ortega	Longleaf Pine-Turkey Oak Hills---------	3,000	Creeping bluestem.
12----------------------- Albany	North Florida Flatwoods----------------	5,000	Panicum.
14----------------------- Pottsburg	North Florida Flatwoods----------------	5,000	Chalky bluestem.
15----------------------- Blanton	Upland Hardwood Hammocks---------------	2,000	Low panicum.
18----------------------- Kershaw	Longleaf Pine-Turkey Oak Hills---------	3,000	Bluestems.
19----------------------- Sapelo	North Florida Flatwoods----------------	5,000	Blue maidencane.
21----------------------- Bonneau	Upland Hardwood Hammocks---------------	2,000	Bluestems.

TABLE 8.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "moderate" and "severe." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
2. Penney	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
3. Penney	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.	Severe: droughty.
4:					
Otela	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
Penney	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
5. Resota	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
6. Ridgewood	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
7. Leon	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.
8:					
Lynn Haven	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
Allanton	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
9. Hurricane	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
10. Garcon	Severe: flooding, too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty, flooding.
11. Ortega	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
12. Albany	Severe: wetness.	Severe: too sandy.	Severe: too sandy, wetness.	Severe: too sandy.	Severe: droughty.
13. Wadley	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
14. Pottsburg	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: too sandy, wetness.	Severe: wetness, too sandy.	Severe: wetness, droughty.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
15-------------------- Blanton	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
16:					
Elloree--------------	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
Osier----------------	Severe: wetness, too sandy, flooding.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, flooding.
Fluvaquents----------	Severe: flooding, wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness, flooding.	Severe: wetness, too clayey, erodes easily.	Severe: wetness, flooding, too clayey.
18-------------------- Kershaw	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
19-------------------- Sapelo	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: too sandy, wetness.	Severe: droughty, wetness.
20:					
Pamlico--------------	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
Dorovan--------------	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
21-------------------- Bonneau	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
22-------------------- Mandarin	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: wetness, droughty.
24. Quartzipsamments					
25-------------------- Wesconnett	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
26-------------------- Surrency	Severe: ponding, too sandy.	Severe: ponding, too sandy.	Severe: too sandy, ponding.	Severe: ponding, too sandy.	Severe: ponding.
27-------------------- Leon	Severe: wetness, too sandy, flooding.	Severe: wetness, too sandy.	Severe: too sandy, wetness, flooding.	Severe: wetness, too sandy.	Severe: wetness, droughty, flooding.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Map symbol and soil name	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
29:					
Shadeville	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
Otela	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
30 Fluvaquents	Severe: flooding, wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey, wetness, flooding.	Severe: wetness, too clayey, erodes easily.	Severe: wetness, flooding, too clayey.
32 Meggett	Severe: flooding, wetness.	Severe: wetness.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, flooding.
33:					
Eunola	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Moderate: wetness.	Moderate: wetness.
Bonneau	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
34:					
Bonneau	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Moderate: droughty.
Blanton	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.
35 Alpin	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: droughty.

TABLE 9.--WILDLIFE HABITAT

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
2, 3: Penney	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
4:										
Otela	Poor	Fair	Good	Fair	Fair	Poor	Poor	Fair	Fair	Very poor.
Penney	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
5: Resota	Poor	Poor	Fair	Poor	Poor	Very poor.	Very poor.	Poor	Poor	Very poor.
6: Ridgewood	Poor	Poor	Fair	Fair	Fair	Poor	Poor	Poor	Fair	Poor.
7: Leon	Poor	Fair	Good	Poor	Fair	Fair	Poor	Fair	Fair	Poor.
8:										
Lynn Haven	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair	Good	Very poor.	Very poor.	Good.
Allanton	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
9: Hurricane	Poor	Poor	Fair	Fair	Fair	Poor	Very poor.	Poor	Fair	Very poor.
10: Garcon	Poor	Fair	Good	Poor	Fair	Poor	Poor	Fair	Fair	Poor.
11: Ortega	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
12: Albany	Fair	Fair	Fair	Fair	Fair	Fair	Poor	Fair	Fair	Poor.
13: Wadley	Poor	Fair	Fair	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.
14: Pottsburg	Poor	Poor	Fair	Poor	Poor	Poor	Poor	Poor	Poor	Poor.
15: Blanton	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
16:										
Elloree	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.
Osier	Very poor.	Poor	Fair	Fair	Fair	Fair	Good	Poor	Fair	Fair.
Fluvaquents	Poor	Fair	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair.

TABLE 9.--WILDLIFE HABITAT--Continued

Map symbol and soil name	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
18----------------- Kershaw	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
19----------------- Sapelo	Poor	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair	Fair.
20:										
Pamlico-----------	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Dorovan-----------	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
21----------------- Bonneau	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
22----------------- Mandarin	Very poor.	Poor	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.
24. Quartzipsamments										
25----------------- Wesconnett	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair	Good	Very poor.	Very poor.	Good.
26----------------- Surrency	Poor	Poor	Poor	Poor	Poor	Fair	Good	Poor	Poor	Fair.
27----------------- Leon	Poor	Fair	Good	Poor	Fair	Fair	Poor	Fair	Fair	Poor.
29:										
Shadeville--------	Fair	Fair	Good	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
Otela-------------	Poor	Fair	Good	Fair	Fair	Poor	Poor	Fair	Fair	Very poor.
30----------------- Fluvaquents	Poor	Fair	Fair	Fair	Poor	Fair	Fair	Fair	Fair	Fair.
32----------------- Meggett	Poor	Fair	Fair	Fair	Good	Good	Good	Fair	Good	Good.
33:										
Eunola------------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Bonneau-----------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
34:										
Bonneau-----------	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Blanton-----------	Poor	Fair	Fair	Fair	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.
35----------------- Alpin	Poor	Fair	Fair	Poor	Fair	Very poor.	Very poor.	Fair	Fair	Very poor.

TABLE 10.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
2----------------- Penney	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: droughty.
3----------------- Penney	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: droughty.
4:						
Otela------------	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
Penney-----------	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: droughty.
5----------------- Resota	Severe: cutbanks cave.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: flooding.	Severe: droughty.
6----------------- Ridgewood	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: droughty.
7----------------- Leon	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.
8:						
Lynn Haven-------	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
Allanton---------	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
9----------------- Hurricane	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Severe: droughty.
10---------------- Garcon	Severe: cutbanks cave, wetness.	Severe: flooding.	Severe: flooding, wetness.	Severe: flooding.	Severe: flooding.	Moderate: wetness, droughty, flooding.
11---------------- Ortega	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Severe: droughty.
12---------------- Albany	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Moderate: wetness.	Severe: droughty.
13---------------- Wadley	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Moderate: droughty.
14---------------- Pottsburg	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, droughty.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
15----------------- Blanton	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Severe: droughty.
16:						
Elloree----------	Severe: wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
Osier------------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.
Fluvaquents------	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.
18----------------- Kershaw	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Severe: droughty.
19----------------- Sapelo	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: droughty, wetness.
20:						
Pamlico----------	Severe: cutbanks cave, excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: low strength, flooding, ponding.	Severe: ponding, flooding, excess humus.
Dorovan----------	Severe: excess humus, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: subsides, ponding, flooding.	Severe: ponding, flooding, excess humus.
21----------------- Bonneau	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
22----------------- Mandarin	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, droughty.
24. Quartzipsamments						
25----------------- Wesconnett	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
26----------------- Surrency	Severe: cutbanks cave, ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.	Severe: ponding.
27----------------- Leon	Severe: cutbanks cave, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, droughty, flooding.
29:						
Shadeville-------	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Severe: droughty.
Otela------------	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Map symbol and soil name	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
30---------------- Fluvaquents	Severe: cutbanks cave, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: flooding, wetness.	Severe: wetness, flooding.	Severe: wetness, flooding, too clayey.
32---------------- Meggett	Severe: wetness.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: flooding, wetness, shrink-swell.	Severe: shrink-swell, wetness, flooding.	Severe: wetness, flooding.
33:						
Eunola-----------	Severe: wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
Bonneau----------	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
34:						
Bonneau----------	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Moderate: droughty.
Blanton----------	Severe: cutbanks cave.	Slight---------	Moderate: wetness.	Slight---------	Slight---------	Severe: droughty.
35---------------- Alpin	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Slight---------	Severe: droughty.

TABLE 11.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
2, 3 Penney	Severe: poor filter.*	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
4:					
Otela	Moderate: wetness, percs slowly.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Penney	Severe: poor filter.*	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
5 Resota	Severe: flooding.	Severe: seepage, flooding.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage.	Poor: seepage, too sandy.
6 Ridgewood	Severe: wetness, poor filter.*	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, seepage.
7 Leon	Severe: wetness, poor filter.*	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
8:					
Lynn Haven	Severe: ponding, poor filter.*	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
Allanton	Severe: ponding.	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: ponding, seepage.	Poor: seepage, too sandy, ponding.
9 Hurricane	Severe: wetness, poor filter.*	Severe: seepage, wetness.	Severe: wetness, seepage, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy.
10 Garcon	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, seepage, wetness.	Poor: too sandy.
11 Ortega	Severe: poor filter.*	Severe: seepage.	Severe: seepage, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
12------------------ Albany	Severe: wetness.	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: too sandy, wetness.
13------------------ Wadley	Slight-----------	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
14------------------ Pottsburg	Severe: wetness, poor filter.*	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: wetness, seepage.	Poor: too sandy, wetness, seepage.
15------------------ Blanton	Moderate: wetness.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: too sandy.
16:					
Elloree------------	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: seepage, flooding, wetness.	Poor: wetness.
Osier--------------	Severe: flooding, wetness, poor filter.*	Severe: seepage, flooding, wetness.	Severe: flooding, wetness, seepage.	Severe: flooding, seepage, wetness.	Poor: seepage, too sandy, wetness.
Fluvaquents--------	Severe: flooding, wetness.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness.
18------------------ Kershaw	Severe: poor filter.*	Severe: seepage.	Severe: too sandy, seepage.	Severe: seepage.	Poor: seepage, too sandy.
19------------------ Sapelo	Severe: wetness, poor filter.*	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
20:					
Pamlico------------	Severe: flooding, ponding, poor filter.*	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, excess humus, ponding.
Dorovan------------	Severe: subsides, flooding, ponding.	Severe: subsides, flooding, ponding.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus.
21------------------ Bonneau	Moderate: wetness.	Severe: seepage.	Severe: wetness.	Severe: seepage.	Good.
22------------------ Mandarin	Severe: wetness, poor filter.*	Severe: seepage, wetness.	Severe: wetness, too sandy.	Severe: wetness, seepage.	Poor: seepage, too sandy.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Map symbol and soil name	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
24. Quartzipsamments					
25: Wesconnett	Severe: ponding, poor filter.*	Severe: seepage, ponding.	Severe: seepage, ponding, too sandy.	Severe: seepage, ponding.	Poor: seepage, too sandy, ponding.
26: Surrency	Severe: ponding.	Severe: seepage, ponding.	Severe: ponding, too sandy.	Severe: seepage, ponding.	Poor: too sandy, ponding.
27: Leon	Severe: wetness, flooding, poor filter.*	Severe: seepage, wetness, flooding.	Severe: seepage, wetness, flooding.	Severe: seepage, wetness, flooding.	Poor: seepage, too sandy, wetness.
29:					
Shadeville	Moderate: depth to rock, wetness, percs slowly.	Severe: seepage.	Severe: depth to rock, wetness, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Otela	Moderate: wetness, percs slowly.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: seepage, too sandy.
30: Fluvaquents	Severe: flooding, wetness, percs slowly.	Severe: seepage, flooding, wetness.	Severe: flooding, seepage, wetness.	Severe: flooding, wetness.	Poor: wetness, thin layer.
32: Meggett	Severe: flooding, wetness, percs slowly.	Severe: flooding, wetness.	Severe: flooding, wetness, too clayey.	Severe: flooding, wetness.	Poor: too clayey, hard to pack, wetness.
33:					
Eunola	Severe: wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: wetness.
Bonneau	Moderate: wetness.	Severe: seepage.	Severe: wetness.	Severe: seepage.	Good.
34:					
Bonneau	Moderate: wetness.	Severe: seepage.	Severe: wetness.	Severe: seepage.	Good.
Blanton	Moderate: wetness.	Severe: seepage.	Severe: too sandy.	Severe: seepage.	Poor: too sandy.
35: Alpin	Severe: poor filter.*	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: too sandy, seepage.

* Because of poor filtration, the contamination of ground water is a hazard in areas that have a concentration of septic tank absorption fields.

TABLE 12.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
2, 3 Penney	Good	Probable	Improbable: too sandy.	Poor: too sandy.
4:				
Otela	Good	Probable	Improbable: too sandy.	Poor: too sandy.
Penney	Good	Probable	Improbable: too sandy.	Poor: too sandy.
5 Resota	Good	Probable	Improbable: too sandy.	Poor: too sandy.
6 Ridgewood	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
7 Leon	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
8:				
Lynn Haven	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Allanton	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
9 Hurricane	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
10 Garcon	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
11 Ortega	Good	Probable	Improbable: too sandy.	Poor: too sandy.
12 Albany	Fair: wetness.	Improbable: thin layer.	Improbable: excess fines.	Poor: too sandy.
13 Wadley	Good	Probable	Improbable: too sandy.	Poor: too sandy.
14 Pottsburg	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
15 Blanton	Good	Probable	Improbable: too sandy.	Poor: too sandy.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
16:				
Elloree	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
Osier	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
Fluvaquents	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: wetness.
18 Kershaw	Good	Probable	Improbable: too sandy.	Poor: too sandy.
19 Sapelo	Poor: wetness.	Improbable: excess fines.	Improbable: too sandy.	Poor: too sandy, wetness.
20:				
Pamlico	Poor: low strength, wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
Dorovan	Poor: low strength, wetness.	Probable	Improbable: too sandy.	Poor: excess humus, wetness.
21 Bonneau	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
22 Mandarin	Fair: wetness.	Probable	Improbable: too sandy.	Poor: too sandy.
24. Quartzipsamments				
25 Wesconnett	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
26 Surrency	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy, wetness.
27 Leon	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too sandy, wetness.
29:				
Shadeville	Fair: depth to rock, thin layer.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy.
Otela	Good	Probable	Improbable: too sandy.	Poor: too sandy.
30 Fluvaquents	Poor: wetness.	Probable	Improbable: too sandy.	Poor: too clayey, wetness.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Map symbol and soil name	Roadfill	Sand	Gravel	Topsoil
32: Meggett	Poor: wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, wetness.
33:				
Eunola	Fair: wetness.	Probable	Improbable: too sandy.	Fair: too clayey.
Bonneau	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
34:				
Bonneau	Good	Improbable: excess fines.	Improbable: excess fines.	Poor: too sandy.
Blanton	Good	Probable	Improbable: too sandy.	Poor: too sandy.
35: Alpin	Good	Probable	Improbable: too sandy.	Poor: too sandy.

TABLE 13.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the "Glossary." See text for definitions of "moderate" and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition; it does not eliminate the need for onsite investigation]

Map symbol and soil name	Limitations for--			Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Terraces and diversions	Grassed waterways
2----------------- Penney	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
3----------------- Penney	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Slope, droughty, fast intake.	Too sandy, soil blowing.	Droughty.
4:							
Otela------------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
Penney-----------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
5----------------- Resota	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
6----------------- Ridgewood	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
7----------------- Leon	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
8:							
Lynn Haven-------	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, fast intake, droughty.	Ponding, too sandy, soil blowing.	Wetness, droughty.
Allanton---------	Severe: seepage.	Severe: seepage, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty.
9----------------- Hurricane	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
10. Garcon	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Flooding	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Droughty.
11. Ortega	Severe: seepage.	Severe: seepage, piping.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
12. Albany	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
13. Wadley	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Too sandy, soil blowing.	Droughty.
14. Pottsburg	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
15. Blanton	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
16:							
Elloree	Severe: seepage.	Severe: wetness, seepage, piping.	Severe: cutbanks cave.	Flooding	Wetness, fast intake, droughty.	Wetness	Wetness, droughty.
Osier	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Flooding, cutbanks cave.	Wetness, droughty, fast intake.	Wetness, too sandy.	Wetness, droughty.
Fluvaquents.							
18. Kershaw	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Too sandy, soil blowing.	Droughty.
19. Sapelo	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, too sandy.	Droughty, wetness.

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
20: Pamilco	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, flooding, subsides.	Ponding, soil blowing, flooding.	Ponding, soil blowing, too sandy.	Wetness.
Dorovan	Severe: seepage.	Severe: excess humus, ponding.	Severe: cutbanks cave.	Ponding, flooding, subsides.	Ponding, soil blowing, flooding.	Ponding, soil blowing.	Wetness.
21 Bonneau	Severe: seepage.	Severe: thin layer.	Severe: cutbanks cave.	Deep to water	Droughty, fast intake, soil blowing.	Soil blowing	Droughty.
22 Mandarin	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Too sandy, soil blowing, wetness.	Droughty.
24. Quartzipsamments							
25 Wesconnett	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy, soil blowing.	Wetness, droughty.
26 Surrency	Severe: seepage.	Severe: seepage, piping, ponding.	Severe: cutbanks cave.	Ponding, cutbanks cave.	Ponding, droughty, fast intake.	Ponding, too sandy.	Wetness, droughty, rooting depth.
27 Leon	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave, flooding.	Wetness, droughty, fast intake.	Wetness, too sandy, soil blowing.	Wetness, droughty.
29: Shadeville	Severe: seepage.	Severe: seepage, piping.	Severe: slow refill, cutbanks cave.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty, percs slowly.
Otela	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
30. Fluvaquents							

TABLE 13.--WATER MANAGEMENT--Continued

Map symbol and soil name	Limitations for-- Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Features affecting-- Drainage	Irrigation	Terraces and diversions	Grassed waterways
32---------------- Meggett	Moderate: seepage.	Severe: hard to pack, wetness.	Severe: slow refill.	Percs slowly, flooding.	Wetness, fast intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
33: Eunola-----------	Moderate: seepage.	Severe: piping, wetness.	Severe: no water.	Favorable------	Wetness, fast intake.	Wetness, soil blowing.	Favorable.
Bonneau----------	Severe: seepage.	Severe: thin layer.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Soil blowing---	Droughty.
34: Bonneau----------	Severe: seepage.	Severe: thin layer.	Severe: no water.	Deep to water	Droughty, fast intake, soil blowing.	Soil blowing---	Droughty.
Blanton----------	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Too sandy, soil blowing.	Droughty.
35---------------- Alpin	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, soil blowing.	Too sandy, soil blowing.	Droughty.

TABLE 14.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
2---------------- Penney	0-7	Fine sand--------	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	7-56	Sand, fine sand	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	56-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	95-100	75-100	4-12	---	NP
3---------------- Penney	0-5	Fine sand--------	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	5-51	Sand, fine sand	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	51-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	95-100	75-100	4-12	---	NP
4: Otela-----------	0-60	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	97-100	95-100	75-100	5-15	---	NP
	60-80	Sandy clay loam, sandy clay, clay.	SC, CL, CH	A-6, A-7	0-5	97-100	95-100	75-100	45-95	35-65	20-39
Penney----------	0-5	Fine sand--------	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	5-46	Sand, fine sand	SP, SP-SM	A-3	0	100	95-100	75-100	2-8	---	NP
	46-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	95-100	75-100	4-12	---	NP
5---------------- Resota	0-80	Fine sand--------	SP, SM, SP-SM	A-3, A-2-4	0	100	100	85-99	1-15	---	NP
6---------------- Ridgewood	0-6	Fine sand--------	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	6-80	Fine sand, sand	SP-SM, SP	A-3, A-2-4	0	100	100	90-100	2-12	---	NP
7---------------- Leon	0-21	Fine sand--------	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	21-40	Sand, fine sand, loamy sand.	SM, SP-SM, SP	A-3, A-2-4	0	100	100	80-100	3-20	---	NP
	40-80	Sand, fine sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
8: Lynn Haven------	0-10	Mucky fine sand	SP-SM, SP, SM	A-3, A-2-4	0	100	100	80-100	2-14	---	NP
	10-25	Sand, fine sand	SP-SM, SP	A-3	0	100	100	80-100	2-10	---	NP
	25-80	Sand, fine sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	70-100	5-20	---	NP
Allanton--------	0-10	Mucky fine sand	SP-SM	A-3, A-2-4	0	100	100	50-100	5-12	---	NP
	10-52	Sand, fine sand	SP-SM	A-3, A-2-4	0	100	100	50-100	5-12	---	NP
	52-80	Sand, fine sand, loamy sand.	SP, SP-SM	A-3	0	100	100	65-100	1-10	---	NP
9---------------- Hurricane	0-72	Fine sand--------	SP, SP-SM	A-3	0	100	100	78-100	3-8	---	NP
	72-80	Sand, fine sand, loamy sand.	SP-SM, SM	A-3, A-2-4	0	100	100	80-100	5-15	---	NP

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Fragments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plasticity index
	In				Pct					Pct	
10--------------- Garcon	0-7	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	100	95-100	80-95	8-20	---	NP
	7-29	Loamy fine sand, loamy sand, fine sand.	SP-SM, SM	A-2-4, A-3	0	100	95-100	80-95	8-20	---	NP
	29-80	Sandy loam, fine sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2-4, A-6	0	100	85-100	80-95	18-41	<36	NP-14
11--------------- Ortega	0-6	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-100	3-8	---	NP
	6-80	Fine sand, sand	SP, SP-SM	A-3	0	100	100	90-100	2-7	---	NP
12--------------- Albany	0-41	Fine sand--------	SM, SP-SM	A-2	0	100	100	75-90	10-20	---	NP
	41-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM, SM-SC	A-2, A-4, A-6	0	97-100	95-100	70-100	19-50	<40	NP-17
13--------------- Wadley	0-43	Fine sand--------	SM, SP-SM	A-2	0	95-100	90-100	50-75	10-30	---	NP
	43-80	Sandy clay loam, sandy loam, fine sandy loam.	SC, SM-SC, CL-ML, CL	A-4, A-2, A-6	0	95-100	90-100	60-90	24-55	19-40	4-20
14--------------- Pottsburg	0-5	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-100	2-10	---	NP
	5-63	Sand, fine sand	SP, SP-SM	A-3	0	100	100	90-100	1-8	---	NP
	63-80	Sand, fine sand, loamy sand.	SP-SM, SP-SM, SP, SM	A-3, A-2-4	0	100	100	90-100	4-18	---	NP
15--------------- Blanton	0-6	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	100	90-100	65-100	5-20	---	NP
	6-44	Sandy loam, loamy sand, loamy coarse sand.	SM	A-2-4	0	100	95-100	65-96	13-30	<25	NP-3
	44-80	Sandy clay loam, sandy loam, sandy clay.	SC, SM-SC, SM, CL	A-4, A-2-4, A-2-6, A-6, A-7	0	100	95-100	69-100	25-55	12-45	3-24
16: Elloree---------	0-4	Loamy fine sand	SM	A-2	0	100	98-100	70-100	15-35	<25	NP-4
	4-25	Sand, fine sand, loamy sand.	SP-SM, SM	A-2, A-3	0	100	98-100	65-100	9-27	---	NP
	25-62	Sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2	0	100	98-100	60-100	15-35	<30	NP-12
	62-80	Loamy sand, sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2, A-4, A-6	0	100	98-100	60-100	15-45	<40	NP-18
Osier-----------	0-7	Fine sand--------	SP-SM	A-2, A-3	0	100	98-100	60-85	5-12	---	NP
	7-80	Sand, loamy sand, loamy fine sand.	SP-SM, SM	A-2, A-3	0	100	95-100	65-96	5-20	---	NP
Fluvaquents.											
18--------------- Kershaw	0-80	Fine sand--------	SP, SP-SM, SW	A-2, A-3	0	98-100	98-100	50-80	1-7	---	NP

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
19---------------Sapelo	0-20	Fine sand--------	SM, SP, SP-SM	A-2, A-3	0	100	100	85-100	4-20	---	NP
	20-41	Fine sand, sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	100	80-100	8-20	---	NP
	41-80	Sandy loam, sandy clay loam, fine sandy loam.	SM, SC, SM-SC	A-2, A-4, A-6	0	100	100	80-100	20-50	<40	NP-20
20:											
Pamlico---------	0-18	Muck-------------	PT	---	0	---	---	---	---	---	---
	18-80	Loamy sand, sand, loamy fine sand.	SM, SP-SM	A-2, A-3	0	100	100	70-95	5-20	---	NP
Dorovan---------	0-65	Muck-------------	PT	---	0	---	---	---	---	---	---
	65-80	Sand, fine sand, loamy fine sand, loam.	SP-SM, SM-SC, SM	A-1, A-3, A-4, A-2-4	0	100	100	5-70	5-49	<20	NP-7
21---------------Bonneau	0-35	Fine sand--------	SM, SP-SM	A-2, A-3	0	100	100	60-95	8-20	---	NP
	35-69	Sandy loam, sandy clay loam, fine sandy loam.	SC, SM-SC	A-2, A-6, A-4	0	100	100	60-100	30-50	21-40	4-21
	69-80	Sandy loam, sandy clay loam, sandy clay.	CL, SC, SM-SC, CL-ML	A-4, A-6, A-2	0	100	100	60-95	25-60	20-40	4-18
22---------------Mandarin	0-20	Fine sand--------	SP, SP-SM	A-3	0	100	100	90-100	2-10	---	NP
	20-29	Fine sand, sand, loamy fine sand.	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-15	---	NP
	29-71	Fine sand, sand	SP, SP-SM	A-3	0	100	100	90-100	2-10	---	NP
	71-80	Fine sand, sand, loamy fine sand.	SP, SP-SM	A-3, A-2-4	0	100	100	90-100	3-12	---	NP
24---------------Quartzipsamments	0-80	Fine sand--------	SP, SP-SM	A-3	0	100	100	85-100	2-10	---	NP
25---------------Wesconnett	0-8	Mucky fine sand	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	8-28	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-15	---	NP
	28-52	Fine sand, sand	SP-SM	A-3, A-2-4	0	100	100	90-100	5-12	---	NP
	52-80	Fine sand, sand	SP-SM, SM	A-3, A-2-4	0	100	100	90-100	5-15	---	NP
26---------------Surrency	0-12	Mucky fine sand	SP-SM, SM, SM-SC	A-3, A-2-4	0	100	95-100	50-100	5-20	<20	NP-5
	12-34	Loamy sand, sand, fine sand.	SP-SM, SM	A-2-4	0	100	95-100	50-100	10-26	---	NP
	34-80	Sandy loam, sandy clay loam.	SM, SM-SC, SC	A-2	0	100	95-100	75-100	22-35	<30	NP-10
27---------------Leon	0-6	Fine sand--------	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	6-21	Fine sand, sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP
	21-40	Fine sand, sand, loamy sand.	SM, SP-SM	A-3, A-2-4	0	100	100	80-100	5-20	---	NP
	40-80	Fine sand, sand	SP, SP-SM	A-3, A-2-4	0	100	100	80-100	2-12	---	NP

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification: Unified	Classification: AASHTO	Frag- ments > 3 inches	Percentage passing sieve number--: 4	10	40	200	Liquid limit	Plas- ticity index
	In				Pct					Pct	
29:											
Shadeville------	0-9	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	100	100	85-100	5-15	---	NP
	9-32	Sand, fine sand	SP-SM, SM	A-3, A-2-4	0	100	100	85-100	5-15	---	NP
	32-42	Sandy loam, fine sandy loam, sandy clay loam.	SM-SC, SC, SM	A-6, A-2-4, A-2-6, A-4	0-3	100	100	85-100	20-45	<35	NP-20
	42	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Otela-----------	0-51	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	97-100	95-100	75-100	5-15	---	NP
	51-62	Sandy clay loam, sandy loam, loamy fine sand.	SC, SM-SC, SM	A-2-6, A-2-4	0	97-100	95-100	75-100	20-50	<40	NP-15
	62-80	Sandy clay loam, sandy clay, clay.	SC, CL, CH	A-6, A-7	0-5	97-100	95-100	75-100	45-95	35-65	20-39
30. Fluvaquents											
32--------------- Meggett	0-11	Fine sand--------	SM	A-2, A-4	0	100	95-100	50-85	15-55	---	NP
	11-40	Clay, sandy clay, clay loam.	CH, MH, CL, SC	A-6, A-7	0	100	90-100	75-100	50-90	30-60	11-30
	40-80	Stratified sand to clay.	---	---	---	---	---	---	---	---	---
33:											
Eunola----------	0-19	Loamy sand-------	SM	A-2	0	100	100	75-100	15-35	<25	NP-4
	19-35	Sandy clay loam, clay loam, sandy loam.	SC, CL, SM-SC, CL-ML	A-2, A-4, A-6	0	100	95-100	75-100	25-55	<35	NP-16
	35-63	Fine sandy loam, sandy loam, sandy clay loam.	SM, SC, SM-SC	A-2, A-4	0	100	95-100	75-100	25-50	<30	NP-8
	63-80	Sandy loam, loamy fine sand, fine sand.	SM, SM-SC, SP-SM	A-2, A-4	0	100	100	75-100	10-45	<28	NP-6
Bonneau---------	0-35	Fine sand--------	SM, SP-SM	A-2, A-3	0	100	100	60-95	8-20	---	NP
	35-69	Sandy loam, sandy clay loam, fine sandy loam.	SC, SM-SC	A-2, A-6, A-4	0	100	100	60-100	30-50	21-40	4-21
	69-80	Sandy loam, sandy clay loam, sandy clay.	CL, SC, SM-SC, CL-ML	A-4, A-6, A-2	0	100	100	60-95	25-60	20-40	4-18
34:											
Bonneau---------	0-35	Fine sand--------	SM, SP-SM	A-2, A-3	0	100	100	60-95	8-20	---	NP
	35-69	Sandy loam, sandy clay loam, fine sandy loam.	SC, SM-SC	A-2, A-6, A-4	0	100	100	60-100	30-50	21-40	4-21
	69-80	Sandy loam, sandy clay loam, sandy clay.	CL, SC, SM-SC, CL-ML	A-4, A-6, A-2	0	100	100	60-95	25-60	20-40	4-18

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Map symbol and soil name	Depth	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
34:											
Blanton----------	0-7	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	100	90-100	65-100	5-20	---	NP
	7-64	Sandy loam, loamy sand, loamy coarse sand.	SM	A-2-4	0	100	95-100	65-96	13-30	<25	NP-3
	64-80	Sandy clay loam, sandy loam, sandy clay.	SC, SM-SC, SM, CL	A-4, A-2-4, A-2-6, A-6, A-7	0	100	95-100	69-100	25-55	12-45	3-24
35--------------- Alpin	0-6	Fine sand--------	SP-SM, SM	A-3, A-2-4	0	95-100	90-100	60-100	5-20	---	NP
	6-51	Fine sand, sand	SP-SM	A-3, A-2-4	0	95-100	90-100	60-100	5-20	---	NP
	51-80	Fine sand, sand	SP-SM, SM	A-2-4	0	95-100	90-100	60-100	11-20	---	NP

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
2: Penney	0-7	0-3	1.30-1.65	6.0-20	0.04-0.08	3.6-6.0	Low	0.10	5	1	0-2
	7-56	0-3	1.35-1.65	6.0-20	0.02-0.06	3.6-6.0	Low	0.10			
	56-80	2-6	1.50-1.65	6.0-20	0.05-0.08	3.6-6.0	Low	0.10			
3: Penney	0-5	0-3	1.30-1.65	6.0-20	0.04-0.08	3.6-6.0	Low	0.10	5	1	0-2
	5-51	0-3	1.35-1.65	6.0-20	0.02-0.06	3.6-6.0	Low	0.10			
	51-80	2-6	1.50-1.65	6.0-20	0.05-0.08	3.6-6.0	Low	0.10			
4:											
Otela	0-60	0-5	1.45-1.65	6.0-20	0.05-0.10	4.5-7.3	Low	0.10	5	1	<2
	60-80	30-65	1.55-1.75	0.06-0.6	0.08-0.18	3.6-8.4	Moderate	0.30			
Penney	0-5	0-3	1.30-1.65	6.0-20	0.04-0.08	3.6-6.0	Low	0.10	5	1	0-2
	5-46	0-3	1.35-1.65	6.0-20	0.02-0.06	3.6-6.0	Low	0.10			
	46-80	2-6	1.50-1.65	6.0-20	0.05-0.08	3.6-6.0	Low	0.10			
5: Resota	0-80	0-3	1.30-1.60	>20	0.02-0.05	3.6-6.5	Low	0.10	5	1	<1
6: Ridgewood	0-6	1-3	1.35-1.55	6.0-20	0.05-0.10	4.5-6.5	Low	0.10	5	1	<1
	6-80	0-5	1.35-1.65	6.0-20	0.03-0.08	4.5-6.5	Low	0.10			
7: Leon	0-21	1-6	1.40-1.65	6.0-20	0.02-0.05	3.6-6.5	Low	0.10	5	1	.5-4
	21-40	2-8	1.50-1.70	0.6-6.0	0.05-0.10	3.6-6.5	Low	0.15			
	40-80	1-6	1.40-1.65	0.6-6.0	0.02-0.05	3.6-6.5	Low	0.10			
8:											
Lynn Haven	0-10	1-4	1.35-1.60	6.0-20	0.10-0.15	3.6-5.5	Low	0.10	5	8	10-20
	10-25	1-4	1.35-1.60	6.0-20	0.05-0.07	3.6-5.5	Low	0.10			
	25-80	2-8	1.40-1.50	0.6-6.0	0.10-0.20	3.6-5.5	Low	0.15			
Allanton	0-10	1-3	1.35-1.60	2.0-6.0	0.15-0.20	4.5-5.5	Low	0.10	5	8	10-20
	10-52	1-3	1.35-1.60	2.0-6.0	0.02-0.06	4.5-5.5	Low	0.10			
	52-80	1-3	1.40-1.55	2.0-6.0	0.10-0.15	3.6-5.5	Low	0.10			
9: Hurricane	0-72	1-4	1.40-1.60	>6.0	0.03-0.07	3.6-6.0	Low	0.10	5	1	<2
	72-80	2-8	1.55-1.70	2.0-6.0	0.10-0.15	3.6-6.0	Low	0.15			
10: Garcon	0-7	3-8	1.25-1.50	6.0-20	0.10-0.15	3.6-5.5	Low	0.10	5	1	1-3
	7-29	3-8	1.40-1.65	6.0-20	0.05-0.10	3.6-5.5	Low	0.10			
	29-80	12-30	1.55-1.70	0.6-2.0	0.10-0.15	3.6-5.5	Low	0.24			
11: Ortega	0-6	1-3	1.20-1.65	6.0-20	0.05-0.08	3.6-6.5	Low	0.10	5	1	1-2
	6-80	1-3	1.35-1.70	6.0-20	0.03-0.06	3.6-6.5	Low	0.10			
12: Albany	0-41	1-10	1.40-1.55	6.0-20	0.02-0.04	3.6-6.5	Low	0.10	5	1	1-2
	41-80	13-35	1.55-1.70	0.6-2.0	0.10-0.16	4.5-6.0	Low	0.24			
13: Wadley	0-43	1-10	1.30-1.70	6.0-20	0.05-0.10	4.5-6.0	Low	0.10	5	1	<1
	43-80	15-35	1.40-1.60	0.6-2.0	0.10-0.13	4.5-5.5	Low	0.20			
14: Pottsburg	0-5	1-4	1.15-1.40	6.0-20	0.05-0.12	3.6-6.5	Low	0.10	5	1	<3
	5-63	0-4	1.30-1.70	6.0-20	0.03-0.10	3.6-6.5	Low	0.10			
	63-80	1-6	1.40-1.70	0.6-2.0	0.10-0.25	3.6-6.0	Low	0.15			

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permea- bility	Available water capacity	Soil reaction	Shrink- swell potential	Erosion factors K	Erosion factors T	Wind erodi- bility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
15---------------- Blanton	0-6	1-7	1.30-1.60	6.0-20	0.03-0.07	4.5-6.0	Low--------	0.10	5	1	.5-1
	6-44	10-18	1.53-1.65	2.0-6.0	0.10-0.15	4.5-5.5	Low--------	0.15			
	44-80	12-40	1.60-1.75	0.6-2.0	0.10-0.15	4.5-5.5	Low--------	0.20			
16: Elloree----------	0-4	2-8	1.40-1.60	6.0-20	0.06-0.11	4.5-7.3	Low--------	0.15	5	1	2-8
	4-25	1-6	1.50-1.70	6.0-20	0.02-0.10	5.1-7.3	Low--------	0.10			
	25-62	9-25	1.30-1.60	2.0-6.0	0.10-0.15	5.1-8.4	Low--------	0.15			
	62-80	5-25	1.30-1.50	2.0-6.0	0.10-0.17	5.1-8.4	Low--------	0.17			
Osier------------	0-7	1-10	1.35-1.60	6.0-20	0.03-0.10	3.6-6.0	Low--------	0.10	5	1	2-5
	7-80	1-10	1.40-1.60	6.0-20	0.03-0.10	3.6-6.0	Low--------	0.10			
Fluvaquents.											
18---------------- Kershaw	0-80	<5	1.35-1.60	>20	0.02-0.05	4.5-6.0	Low--------	0.10	5	1	<1
19---------------- Sapelo	0-20	2-5	1.40-1.65	6.0-20	0.03-0.07	3.6-5.5	Low--------	0.10	5	1	1-3
	20-41	3-7	1.35-1.60	0.6-2.0	0.10-0.15	3.6-5.5	Low--------	0.15			
	41-80	10-30	1.55-1.75	0.6-2.0	0.12-0.17	3.6-5.5	Low--------	0.24			
20: Pamlico----------	0-18	---	0.20-0.65	0.6-6.0	0.24-0.40	3.6-4.4	Low--------	----	---	8	20-60
	18-80	5-10	1.60-1.75	6.0-20	0.10-0.20	3.6-5.5	Low--------	0.10			
Dorovan----------	0-65	---	0.35-0.55	0.6-2.0	0.20-0.25	3.6-4.4	Low--------	----	---	8	20-60
	65-80	5-20	1.40-1.65	6.0-20	0.05-0.08	4.5-5.5	Low--------	----			
21---------------- Bonneau	0-35	2-8	1.30-1.70	6.0-20	0.04-0.08	4.5-6.0	Low--------	0.15	5	1	.5-2
	35-69	18-35	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low--------	0.20			
	69-80	15-40	1.40-1.60	0.6-2.0	0.10-0.16	4.5-5.5	Low--------	0.20			
22---------------- Mandarin	0-20	0-3	1.35-1.55	6.0-20	0.03-0.07	3.6-6.0	Low--------	0.10	5	1	<3
	20-29	2-9	1.45-1.60	0.6-2.0	0.10-0.15	3.6-6.0	Low--------	0.15			
	29-71	0-3	1.35-1.60	6.0-20	0.03-0.07	3.6-7.3	Low--------	0.10			
	71-80	2-9	1.45-1.60	0.6-2.0	0.10-0.15	3.6-7.3	Low--------	0.15			
24. Quartzipsamments											
25---------------- Wesconnett	0-8	2-7	1.10-1.30	6.0-20	0.15-0.30	3.6-6.5	Low--------	0.10	5	8	10-20
	8-28	3-8	1.30-1.55	0.6-6.0	0.10-0.15	3.6-6.5	Low--------	0.15			
	28-52	2-7	1.35-1.50	6.0-20	0.05-0.08	3.6-6.5	Low--------	0.10			
	52-80	2-8	1.40-1.65	0.6-6.0	0.10-0.15	3.6-6.5	Low--------	0.15			
26---------------- Surrency	0-12	2-8	0.80-1.25	6.0-20	0.15-0.30	3.6-5.5	Low--------	0.10	5	8	10-20
	12-34	<10	1.50-1.65	2.0-20	0.05-0.10	3.6-5.5	Low--------	0.10			
	34-80	10-23	1.60-1.85	0.6-6.0	0.06-0.10	3.6-5.5	Low--------	0.15			
27---------------- Leon	0-6	1-6	1.30-1.55	6.0-20.0	0.05-0.10	3.6-5.5	Low--------	0.10	5	1	.5-4
	6-21	1-6	1.30-1.65	6.0-20.0	0.02-0.05	3.6-5.5	Low--------	0.10			
	21-40	2-8	1.35-1.70	0.6-6.0	0.10-0.20	3.6-5.5	Low--------	0.15			
	40-80	1-6	1.40-1.75	0.6-20.0	0.02-0.20	3.6-5.5	Low--------	0.10			
29: Shadeville-------	0-9	2-10	1.40-1.60	2.0-6.0	0.05-0.10	4.5-7.3	Low--------	0.10	3	1	.5-2
	9-32	2-10	1.45-1.70	2.0-6.0	0.05-0.10	4.5-7.3	Low--------	0.10			
	32-42	14-35	1.45-1.70	0.06-0.2	0.10-0.15	4.5-8.4	Low--------	0.20			
	42	---	---	---	---	---	-----------	----			

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Map symbol and soil name	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Shrink-swell potential	Erosion factors K	Erosion factors T	Wind erodibility group	Organic matter
	In	Pct	g/cc	In/hr	In/in	pH					Pct
29:											
Otela-----------	0-51	0-5	1.45-1.65	6.0-20	0.05-0.10	4.5-7.3	Low--------	0.10	5	1	<2
	51-62	8-35	1.55-1.75	0.06-0.6	0.06-0.15	3.6-7.8	Low--------	0.23			
	62-80	30-65	1.55-1.75	0.06-0.6	0.08-0.18	3.6-8.4	Moderate	0.30			
30. Fluvaquents											
32--------------- Meggett	0-11	3-10	1.20-1.50	2.0-6.0	0.10-0.15	4.5-6.5	Low--------	0.15	5	1	2-8
	11-40	30-60	1.45-1.60	0.06-0.2	0.13-0.18	5.1-8.4	High-------	0.32			
	40-80	---	---	---	---	---	----------	----			
33:											
Eunola----------	0-19	5-15	1.40-1.60	6.0-20	0.06-0.11	3.6-6.5	Low--------	0.17	5	1	.5-4
	19-35	18-35	1.30-1.70	0.6-2.0	0.11-0.16	4.5-6.0	Low--------	0.24			
	35-63	10-30	1.30-1.70	2.0-6.0	0.10-0.15	4.5-6.0	Low--------	0.24			
	63-80	5-15	1.30-1.80	2.0-20	0.06-0.12	4.5-6.0	Low--------	0.17			
Bonneau---------	0-35	2-8	1.30-1.70	6.0-20	0.04-0.08	4.5-6.0	Low--------	0.15	5	1	.5-2
	35-69	18-35	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low--------	0.20			
	69-80	15-40	1.40-1.60	0.6-2.0	0.10-0.16	4.5-5.5	Low--------	0.20			
34:											
Bonneau---------	0-35	2-8	1.30-1.70	6.0-20	0.04-0.08	4.5-6.0	Low--------	0.15	5	1	.5-2
	35-69	18-35	1.40-1.60	0.6-2.0	0.10-0.15	4.5-5.5	Low--------	0.20			
	69-80	15-40	1.40-1.60	0.6-2.0	0.10-0.16	4.5-5.5	Low--------	0.20			
Blanton---------	0-7	1-7	1.30-1.60	6.0-20	0.03-0.07	4.5-6.0	Low--------	0.10	5	1	.5-1
	7-64	10-18	1.53-1.65	2.0-6.0	0.10-0.15	4.5-5.5	Low--------	0.15			
	64-86	12-40	1.60-1.75	0.6-2.0	0.10-0.15	4.5-5.5	Low--------	0.20			
35--------------- Alpin	0-6	1-12	1.35-1.55	2.0-6.0	0.05-0.10	4.5-6.5	Low--------	0.10	5	1	0-2
	6-51	1-7	1.40-1.55	6.0-20.0	0.03-0.09	4.5-6.5	Low--------	0.10			
	51-80	5-8	1.45-1.65	2.0-6.0	0.06-0.09	4.5-6.5	Low--------	0.10			

TABLE 16.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "frequent," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Map symbol and soil name	Hydro-logic group	Flooding			High water table			Subsidence		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Initial	Total	Uncoated steel	Concrete
					Ft			In	In		
2, 3: Penney	A	None	---	---	>6.0	---	---	---	---	Low	High.
4:											
Otela	A	None	---	---	4.0-6.0	Perched	Mar-Aug	---	---	Low	Low.
Penney	A	None	---	---	>6.0	---	---	---	---	Low	High.
5: Resota	A	Occasional	Brief	Dec-Apr	4.0-5.0	Apparent	Mar-Aug	---	---	Low	High.
6: Ridgewood	C	None	---	---	2.0-3.5	Apparent	Mar-Aug	---	---	Low	High.
7: Leon	B/D	None	---	---	0.5-1.5	Apparent	Mar-Sep	---	---	High	High.
8:											
Lynn Haven	D	None	---	---	+2-0	Apparent	Jan-Dec	---	---	Moderate	High.
Allanton	D	None	---	---	+2-0	Apparent	Jan-Dec	---	---	High	High.
9: Hurricane	C	None	---	---	2.0-3.5	Apparent	Mar-Sep	---	---	Low	Moderate.
10: Garcon	C	Occasional	Brief	Dec-Apr	1.5-3.0	Apparent	Mar-Aug	---	---	High	High.
11: Ortega	A	None	---	---	4.0-5.0	Apparent	Mar-Aug	---	---	Low	High.
12: Albany	C	None	---	---	1.0-2.5	Apparent	Mar-Aug	---	---	High	High.
13: Wadley	A	None	---	---	>6.0	---	---	---	---	Low	Moderate.
14: Pottsburg	B/D	None	---	---	0.5-1.5	Apparent	Mar-Sep	---	---	High	High.
15: Blanton	A	None	---	---	4.0-6.0	Perched	Mar-Aug	---	---	High	High.
16:											
Elloree	D	Frequent	Brief to long.	Dec-Apr	0-1.0	Apparent	Jan-Dec	---	---	High	Moderate.
Osier	B/D	Frequent	Brief	Dec-Apr	0-1.0	Apparent	Jan-Dec	---	---	High	High.
Fluvaquents	D	Frequent	Long	Dec-Apr	0-1.0	Apparent	Jan-Dec	---	---	High	Moderate.
18: Kershaw	A	None	---	---	>6.0	---	---	---	---	Low	High.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Map symbol and soil name	Hydro-logic group	Flooding: Frequency	Flooding: Duration	Flooding: Months	High water table: Depth	High water table: Kind	High water table: Months	Subsidence: Initial	Subsidence: Total	Risk of corrosion: Uncoated steel	Risk of corrosion: Concrete
					Ft			In	In		
19 Sapelo	D	None	---	---	0.5-1.5	Apparent	Mar-Sep	---	---	High	High.
20: Pamlico	D	Frequent	Brief to long.	Dec-Apr	+1-0	Apparent	Jan-Dec	4-12	10-29	High	High.
Dorovan	D	Frequent	Very long.	Dec-Apr	+1-0	Apparent	Jan-Dec	6-12	51-80	High	High.
21 Bonneau	A	None	---	---	4.0-5.0	Apparent	Mar-Aug	---	---	Low	High.
22 Mandarin	C	None	---	---	1.5-3.5	Apparent	Mar-Aug	---	---	Moderate	High.
24. Quartzipsamments											
25 Wesconnett	D	None	---	---	+2-0	Apparent	Jan-Dec	---	---	Moderate	High.
26 Surrency	D	None	---	---	+1-0	Apparent	Jan-Dec	---	---	High	High.
27 Leon	B/D	Frequent	Brief to long.	Dec-Apr	0.5-1.5	Apparent	Jan-Dec	---	---	High	High.
29: Shadeville	B	None	---	---	4.0-6.0	Perched	Mar-Aug	---	---	Low	Moderate.
Otela	A	None	---	---	4.0-6.0	Perched	Mar-Aug	---	---	Low	Low.
30 Fluvaquents	D	Frequent	Long	Dec-Apr	0-1.0	Apparent	Jan-Dec	---	---	High	Moderate.
32 Meggett	D	Frequent	Long	Dec-Apr	0-1.0	Apparent	Jan-Dec	---	---	High	Moderate.
33: Eunola	B	None	---	---	1.5-2.5	Perched	Mar-Aug	---	---	Moderate	High.
Bonneau	A	None	---	---	4.0-5.0	Perched	Mar-Aug	---	---	Low	High.
34: Bonneau	A	None	---	---	4.0-5.0	Perched	Mar-Aug	---	---	Low	High.
Blanton	A	None	---	---	4.0-6.0	Perched	Mar-Aug	---	---	High	High.
35 Alpin	A	None	---	---	>6.0	---	---	---	---	Low	High.

TABLE 17.--PHYSICAL ANALYSIS OF SELECTED SOILS

[The pedons for all of the soils listed are typical of the series in the survey area. For the location of the sample site, see the series description in the section "Soil Series and Their Morphology"]

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity*	Bulk density (field moist)*	Water content*: 1/10 bar	1/3 bar	15 bar
	In		Pct								Cm/hr	g/cc	Pct (wt)		
Albany fine sand:															
S87FL-041-011-1	0-7	A	0.0	1.8	34.1	57.1	3.5	96.5	1.6	1.9	22.0	1.46	8.0	5.0	1.5
-2	7-24	E1	0.0	1.2	29.9	59.9	4.6	95.6	2.5	1.9	25.6	1.60	5.5	3.1	0.8
-3	24-41	E2	0.0	1.6	29.0	60.6	4.4	95.6	2.2	2.2	30.8	1.56	4.2	2.4	0.6
-4	41-60	Btg1	0.0	1.3	23.5	52.7	4.0	81.5	2.6	15.9	0.5	1.73	15.4	12.0	6.1
-5	60-80	Btg2	0.0	1.7	25.5	50.3	4.0	81.5	2.7	15.8	0.9	1.72	15.9	9.7	4.1
Blanton fine sand:															
S87FL-041-012-1	0-6	Ap	0.4	3.0	9.4	52.1	26.5	91.4	6.4	2.2	7.6	1.47	13.4	6.4	2.2
-2	6-29	E1	0.3	2.5	8.6	50.4	28.4	90.2	7.8	2.0	7.9	1.62	12.8	3.5	0.8
-3	29-44	E2	0.5	3.1	9.4	52.7	25.8	91.5	7.2	1.3	9.3	1.57	6.9	2.7	0.5
-4	44-60	Bt	0.4	2.9	6.8	40.5	20.7	71.3	7.0	21.7	0.1	1.76	15.5	12.2	6.2
-5	60-80	Btg	0.6	5.2	9.4	15.8	19.4	50.4	18.5	31.1	0.1	1.79	17.9	16.8	10.7
Eunola fine sand:															
S87FL-014-018-1	0-9	Ap	0.1	1.2	18.2	64.0	9.7	93.2	3.3	3.5	13.1	1.55	8.5	5.6	1.7
-2	9-19	E	0.0	1.1	16.2	64.3	9.5	91.1	3.9	5.0	7.2	1.69	7.3	4.6	1.9
-3	19-26	Bt1	0.0	1.2	12.8	58.2	7.8	80.0	3.8	16.2	0.1	1.70	15.2	11.3	6.6
-4	26-35	Bt2	0.0	0.6	10.2	53.6	5.2	69.6	3.4	27.0	0.4	1.68	19.7	16.4	9.7
-5	35-63	BC	0.0	0.5	9.9	65.3	4.2	79.9	1.7	18.4	0.7	1.72	16.2	13.9	7.9
-6	63-80	Cg	0.0	0.4	9.4	65.8	3.4	79.0	2.3	18.7	0.7	1.84	10.5	8.3	5.2
Garcon fine sand:															
S87FL-041-016-1	0-7	A	0.1	0.3	1.7	67.4	20.2	89.7	2.0	8.3	3.9	1.25	17.1	10.3	2.2
-2	7-17	E1	0.0	0.2	1.4	68.7	19.5	89.8	7.5	2.7	10.7	1.50	14.9	5.1	0.9
-3	17-29	E2	0.0	0.2	1.5	68.1	20.3	90.1	7.0	2.9	13.4	1.49	8.0	3.9	1.0
-4	29-40	Bt1	0.0	0.2	1.1	58.7	18.2	78.2	6.7	15.1	2.9	1.69	12.7	7.9	3.2
-5	40-58	Bt2	0.0	0.0	0.5	46.8	15.9	63.2	9.8	27.0	0.6	1.62	21.8	19.1	10.4
-6	58-80	C	0.0	0.0	0.3	77.4	13.0	90.7	1.1	8.2	21.4	1.56	5.0	2.4	0.6
Hurricane fine sand:															
S86FL-041-004-1	0-6	Ap	0.0	1.1	35.5	56.2	4.0	96.8	2.1	1.1	33.3	1.49	6.6	4.0	0.8
-2	6-20	E1	0.0	1.1	38.1	53.9	3.1	96.2	1.6	2.2	46.0	1.51	4.5	2.7	0.6
-3	20-29	E2	0.0	1.3	38.8	52.9	3.2	96.2	1.6	2.2	48.3	1.50	4.3	2.5	0.6
-4	29-45	E3	0.0	1.4	37.0	55.4	3.3	97.1	1.2	1.7	48.0	1.57	3.4	1.7	0.2
-5	45-65	E3	0.0	1.3	34.9	56.8	4.3	97.3	2.2	0.5	38.8	1.60	2.8	1.6	0.2
-6	65-72	E4	0.0	0.9	45.0	46.9	1.3	94.1	3.5	2.4	8.0	1.76	4.3	3.1	1.1
-7	72-80	Bh	0.0	2.1	44.6	50.1	1.6	97.5	1.7	0.8	30.9	1.70	3.8	2.5	0.3

See footnotes at end of table.

TABLE 17.--PHYSICAL ANALYSIS OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity*	Bulk density (field moist)*	Water content*: 1/10 bar	1/3 bar	15 bar
	In		Pct								Cm/hr	g/cc	Pct (wt)		
Kershaw fine sand:															
S87FL-041-009-1	0-5	A	0.0	0.1	7.5	81.2	8.8	97.6	0.2	2.1	22.4	1.54	5.9	3.4	0.5
-2	5-25	C1	0.0	0.1	8.6	81.3	8.1	98.1	0.2	1.7	35.5	1.53	3.7	2.0	0.3
-3	25-45	C1	0.0	0.1	8.8	80.9	8.3	98.1	0.1	1.8	46.0	1.52	3.3	1.7	0.2
-4	45-80	C2	0.0	0.1	9.7	82.1	6.7	98.6	0.1	1.3	51.4	1.57	2.6	1.3	0.1
Leon fine sand:															
S86FL-041-006-1	0-6	Ap	0.0	1.9	32.4	57.0	5.0	96.3	3.7	0.1	18.2	1.43	11.1	7.9	2.3
-2	6-15	E1	0.0	2.0	32.1	58.5	5.1	97.6	2.4	0.1	24.8	1.58	5.5	3.1	0.9
-3	15-21	E2	0.0	2.4	30.0	59.4	4.8	96.6	3.3	0.1	19.2	1.56	6.4	3.8	0.9
-4	21-28	Bh1	0.0	2.3	31.4	58.5	5.1	97.3	0.8	1.9	1.2	1.36	26.3	18.7	3.9
-5	28-40	Bh2	0.0	2.1	30.8	60.8	5.0	98.8	0.5	0.7	9.7	1.61	9.3	6.3	1.3
-6	40-60	BC	0.0	2.4	29.4	60.5	5.1	97.4	1.9	0.7	21.5	1.69	3.6	2.1	0.2
-7	60-80	C	0.0	2.2	32.7	59.4	4.5	98.8	1.1	0.1	38.7	1.75	2.1	1.1	0.1
Mandarin fine sand:															
S86FL-041-005-1	0-6	Ap	0.0	1.0	38.0	55.3	3.8	98.1	1.9	0.1	27.6	1.54	5.6	3.5	1.0
-2	6-20	E	0.0	1.2	37.8	54.9	3.9	97.8	2.0	0.2	37.5	1.58	3.2	2.0	0.4
-3	20-24	Bh1	0.0	1.2	32.8	52.4	3.7	90.1	5.1	4.8	5.7	1.40	21.6	14.5	3.3
-4	24-29	Bh2	0.0	1.4	35.9	52.4	3.4	93.1	3.7	3.2	15.5	1.58	10.4	7.1	1.4
-5	29-59	E'1	0.0	1.1	34.9	55.9	4.0	95.9	2.7	1.4	28.4	1.64	5.2	3.1	0.4
-6	59-71	E'2	0.0	1.0	35.8	53.6	2.2	92.6	5.4	2.0	13.8	1.72	8.6	6.2	0.8
-7	71-80	B'h	0.0	1.5	31.4	62.5	2.9	98.3	0.6	1.1	14.9	1.54	15.3	11.1	1.8
Meggett fine sand:**															
S87FL-041-015-1	0-4	A	0.0	3.3	23.7	51.7	12.3	91.0	6.0	3.0	2.5	1.49	12.3	7.4	2.0
-2	4-11	E	0.3	3.5	22.9	52.7	12.7	92.1	5.0	2.9	5.8	1.68	7.4	4.0	0.8
-3	11-31	Btg1	0.0	1.3	13.9	32.6	7.4	55.2	8.2	36.6	0.0	1.44	32.7	28.7	15.3
-4	31-40	Btg2	0.6	2.7	13.8	28.0	6.7	51.8	9.8	38.6	0.0	1.60	25.9	25.5	15.3
-5	40-60	Cg	0.4	2.4	13.3	28.1	7.7	51.9	19.9	28.2	0.0	1.71	20.6	18.8	10.7
-6	60-80	Cg	4.0	6.4	12.2	22.2	7.4	52.2	16.1	31.7	0.0	1.56	26.8	22.4	9.7
Ortega fine sand:															
S87FL-041-008-1	0-6	Ap	0.0	0.8	43.9	51.4	1.5	97.7	0.9	1.4	30.9	1.47	6.3	4.0	0.7
-2	6-29	C1	0.0	0.9	45.2	48.9	1.5	96.5	2.0	1.5	50.0	1.47	3.6	2.1	0.3
-3	29-52	C1	0.0	0.8	43.1	51.6	1.4	96.9	1.9	1.2	55.4	1.59	2.9	1.9	0.2
-4	52-60	C2	0.0	0.6	43.9	51.2	1.6	97.3	2.1	0.6	24.3	1.64	3.1	1.8	0.2
-5	60-80	C3	0.0	0.5	44.0	53.3	0.9	98.7	1.1	0.2	45.4	1.65	2.0	1.2	0.1

See footnotes at end of table.

TABLE 17.--PHYSICAL ANALYSIS OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity*	Bulk density (field moist)*	Water content*: 1/10 bar	1/3 bar	15 bar
	In		Pct								Cm/hr	g/cc	Pct (wt)		
Otela sand:***															
S87FL-041-007-1	0-10	Ap	0.2	6.2	31.2	47.8	9.9	95.4	2.3	2.3	17.1	1.67	7.0	3.8	0.8
-2	10-32	E1	0.0	4.4	29.4	49.6	11.3	94.7	2.8	2.5	19.3	1.61	4.1	2.5	0.6
-3	32-42	E2	0.1	5.8	29.1	49.7	10.7	95.4	2.7	1.9	13.7	1.66	3.0	1.7	0.2
-4	42-51	E3	0.0	5.2	30.3	51.2	10.3	97.0	1.8	1.2	16.8	1.69	3.0	1.8	0.1
-5	51-62	Bt	0.0	3.1	22.8	40.3	7.6	73.8	3.2	23.0	0.1	1.81	16.9	13.1	7.9
-6	62-80	Btg	0.1	3.0	18.9	33.8	6.6	62.4	3.4	34.2	0.1	1.75	19.4	15.2	9.7
Penney fine sand:															
S86FL-041-001-1	0-7	A	0.2	6.1	37.2	50.8	3.6	97.9	2.1	0.1	28.5	1.66	5.2	3.2	0.8
-2	7-17	E1	0.1	5.6	34.2	52.5	3.7	96.1	2.3	1.8	42.3	1.64	4.1	2.4	0.7
-3	17-36	E2	0.1	5.3	32.9	53.9	4.2	96.4	1.6	2.0	45.2	1.61	4.2	2.4	0.8
-4	36-56	E2	0.1	4.7	30.4	57.4	4.2	96.8	1.8	1.4	38.3	1.64	3.7	2.1	0.6
-5	56-80	E&Bt	0.2	5.0	30.6	57.4	4.2	97.4	1.5	1.1	38.8	1.64	2.9	1.6	0.3
Resota fine sand:															
S87FL-041-017-1	0-5	A	0.3	3.2	8.1	63.7	21.4	96.6	2.3	1.1	29.5	1.29	9.2	5.5	1.6
-2	5-12	E	0.6	4.0	8.3	67.6	17.2	97.7	1.7	0.6	22.1	1.53	4.9	2.5	0.6
-3	12-16	Bw1	0.4	3.5	7.5	63.9	19.1	94.4	3.1	2.5	26.0	1.39	10.5	6.0	1.6
-4	16-26	Bw2	0.5	3.6	7.1	65.2	19.5	95.9	2.3	1.8	26.6	1.43	7.8	4.4	1.0
-5	26-55	Bw3	0.4	3.1	7.0	67.3	18.5	96.3	1.9	1.8	28.4	1.55	5.0	2.3	0.5
-6	55-80	C	0.4	1.8	4.1	75.3	16.4	98.0	1.1	0.9	19.6	1.57	4.5	2.1	0.2
Ridgewood fine sand:															
S86FL-041-003-1	0-6	Ap	0.0	0.7	42.3	52.6	1.9	97.5	2.4	0.1	48.3	1.55	4.8	2.8	0.4
-2	6-25	C1	0.0	0.7	40.5	54.0	1.8	97.0	1.1	1.9	14.1	1.53	5.0	2.9	0.7
-3	25-40	C2	0.0	0.9	42.7	52.4	1.4	97.4	0.9	1.7	67.4	1.54	3.8	2.1	0.4
-4	40-60	C3	0.0	0.9	40.8	54.8	1.9	98.4	0.2	1.4	50.9	1.56	3.4	2.2	0.4
-5	60-80	C3	0.0	0.6	40.9	55.3	1.9	98.7	0.3	1.0	22.1	1.61	2.2	1.4	0.1
Sapelo fine sand:															
S87FL-041-014-1	0-5	A	0.0	1.2	33.1	54.1	7.0	95.4	4.5	0.1	16.4	1.43	12.3	7.8	2.6
-2	5-20	E	0.0	1.4	27.8	58.2	9.1	96.5	3.4	0.1	11.3	1.67	4.8	2.2	0.4
-3	20-25	Bh	0.0	1.8	28.4	54.6	8.2	93.0	2.9	4.1	2.2	1.53	18.0	12.9	2.5
-4	25-29	BE	0.0	1.5	27.1	55.4	8.6	92.7	5.0	2.3	5.5	1.62	10.7	7.3	1.4
-5	29-35	E'	0.0	1.4	25.4	57.4	10.0	94.2	4.4	1.4	10.6	1.62	10.0	6.5	0.9
-6	35-41	EB	0.0	1.7	24.5	50.6	7.8	84.6	4.8	10.6	0.2	1.69	17.5	14.6	4.9
-7	41-67	Btg1	0.0	1.4	24.3	43.8	5.0	74.5	5.0	20.5	0.0	1.61	21.7	18.6	9.3
-8	67-80	Btg2	0.1	1.9	26.0	47.8	3.1	78.9	3.2	17.9	0.1	1.81	15.3	13.0	6.8

See footnotes at end of table.

TABLE 17.--PHYSICAL ANALYSIS OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Particle-size distribution: Sand: Very coarse (2-1 mm)	Coarse (1-0.5 mm)	Medium (0.5-0.25 mm)	Fine (0.25-0.1 mm)	Very fine (0.1-0.05 mm)	Total (2-0.05 mm)	Silt (0.05-0.002 mm)	Clay (<0.002 mm)	Hydraulic conductivity*	Bulk density (field moist)*	Water content*: 1/10 bar	1/3 bar	15 bar
	In		Pct								Cm/hr	g/cc	Pct (wt)		
Shadeville fine sand:															
S87FL-041-013-1	0-9	Ap	0.1	2.3	13.7	62.5	18.3	96.9	1.6	1.5	10.8	1.59	7.6	4.1	1.3
-2	9-21	E1	0.1	2.8	14.7	60.0	18.5	96.1	2.7	1.2	16.1	1.62	5.2	2.3	0.3
-3	21-32	E2	0.0	2.6	13.0	61.2	18.7	95.6	3.1	1.3	20.8	1.61	5.3	2.3	0.6
-4	32-38	Bt	0.0	0.4	9.5	50.1	8.7	68.7	3.1	28.2	0.3	1.71	18.6	12.9	7.4
-5	38-42	Btg	0.0	0.8	10.4	46.6	10.4	68.2	4.0	27.8	0.0	1.71	17.7	13.5	7.1

* Some of these data are slightly outside the range of properties given in table 15. The original concept has not been changed at this time because of the small amount of data available.

** The soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.

*** The soil was correlated as fine sand. Data are marginal to fine sand.

TABLE 18.--CHEMICAL ANALYSIS OF SELECTED SOILS

[The pedons for all of the soils listed are typical of the series in the survey area. For the location of the sample site, see the series description in the section "Soil Series and Their Morphology"]

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Extractable bases: Mg	Extractable bases: Na	Extractable bases: K	Extractable bases: Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH* H_2O (1:1)	pH* $CaCl_2$ 0.01M (1:2)	pH* KCl 1N (1:1)	Pyrophosphate extractable: C	Pyrophosphate extractable: Fe	Pyrophosphate extractable: Al	Citrate-dithionite extractable: Fe	Citrate-dithionite extractable: Al
	In		Milliequivalents/100 grams of soil							Pct	Pct	Mmhos/cm				Pct				
Albany fine sand:																				
S87FL-041-011-1	0-7	A	0.26	0.04	0.05	0.01	0.36	6.25	6.61	5	1.00	0.03	4.3	4.0	3.6	---	---	---	---	---
-2	7-24	E1	0.04	0.02	0.03	0.00	0.09	2.20	2.29	4	0.22	0.03	4.4	4.5	4.6	---	---	---	---	---
-3	24-41	E2	0.02	0.01	0.02	0.00	0.05	1.52	1.57	5	0.13	0.02	4.4	4.3	4.6	---	---	---	---	---
-4	41-60	Btg1	0.09	0.10	0.02	0.01	0.22	5.48	5.70	4	0.02	0.03	4.1	3.8	4.2	---	---	---	0.15	0.07
-5	60-80	Btg2	0.08	0.16	0.03	0.01	0.28	6.57	6.85	4	0.05	0.02	4.2	4.0	4.2	---	---	---	0.64	0.14
Blanton fine sand:																				
S87FL-041-012-1	0-6	Ap	0.92	0.24	0.02	0.07	1.25	4.42	5.67	22	1.02	0.04	5.1	4.7	4.7	---	---	---	---	---
-2	6-29	E1	0.51	0.05	0.01	0.02	0.59	0.72	1.31	45	0.14	0.02	5.4	5.2	5.3	---	---	---	---	---
-3	29-44	E2	0.26	0.02	0.02	0.00	0.30	0.43	0.73	41	0.06	0.02	5.5	5.3	5.4	---	---	---	---	---
-4	44-60	Bt	0.23	0.29	0.03	0.02	0.57	7.10	7.67	7	0.10	0.03	4.2	4.0	4.2	---	---	---	0.67	0.12
-5	60-80	Btg	0.05	0.34	0.05	0.03	0.47	10.59	11.06	4	0.06	0.02	4.2	3.9	3.9	---	---	---	0.65	0.11
Eunola fine sand:																				
S87FL-014-018-1	0-9	Ap	4.42	1.48	0.03	0.14	6.07	2.50	8.57	71	0.69	0.10	6.0	5.9	6.2	---	---	---	---	---
-2	9-19	E	1.57	0.78	0.05	0.09	2.49	2.52	5.01	50	0.27	0.07	5.8	5.7	5.8	---	---	---	---	---
-3	19-26	Bt1	0.78	1.27	0.04	0.16	2.25	5.31	7.56	30	0.26	0.07	4.5	4.3	4.4	---	---	---	0.57	0.10
-4	26-35	Bt2	0.43	0.86	0.03	0.16	1.48	9.29	10.77	14	0.21	0.07	3.9	3.9	4.0	---	---	---	1.06	0.14
-5	35-63	BC	0.68	0.45	0.02	0.07	1.22	6.12	7.34	17	0.03	0.08	3.9	4.0	4.2	---	---	---	---	---
-6	63-80	Cg	0.47	0.11	0.03	0.05	0.66	4.31	4.97	13	0.02	0.06	3.9	3.9	4.0	---	---	---	---	---
Garcon fine sand:																				
S87FL-041-016-1	0-7	A	0.51	0.07	0.04	0.02	0.64	4.54	5.18	12	0.98	0.07	4.6	4.3	4.2	---	---	---	---	---
-2	7-17	E1	0.25	0.03	0.03	0.00	0.31	2.01	2.32	13	0.30	0.03	4.9	4.7	4.7	---	---	---	---	---
-3	17-29	E2	0.15	0.02	0.02	0.01	0.20	0.86	1.06	19	0.18	0.03	4.8	4.5	4.6	---	---	---	---	---
-4	29-40	Bt1	0.46	0.34	0.04	0.01	0.85	4.90	5.75	15	0.08	0.03	4.4	3.9	4.2	---	---	---	0.33	0.08
-5	40-58	Bt2	0.46	0.27	0.06	0.03	0.82	12.96	13.78	6	0.16	0.04	4.0	3.7	3.8	---	---	---	0.72	0.11
-6	58-80	C	0.08	0.02	0.04	0.01	0.15	3.21	3.36	4	0.02	0.02	4.2	3.8	4.1	---	---	---	---	---
Hurricane fine sand:																				
S86FL-041-004-1	0-6	Ap	0.24	0.09	0.04	0.00	0.37	3.39	3.76	10	0.97	0.02	4.8	4.7	4.2	---	---	---	---	---
-2	6-20	E1	0.05	0.04	0.04	0.00	0.23	1.25	1.48	15	0.27	0.02	4.8	4.9	4.8	---	---	---	---	---
-3	20-29	E2	0.05	0.04	0.04	0.00	0.13	1.81	1.94	7	0.28	0.02	4.6	4.8	4.6	---	---	---	---	---
-4	29-45	E3	0.03	0.02	0.03	0.00	0.08	0.88	0.96	8	0.13	0.01	4.7	4.6	4.6	---	---	---	---	---
-5	45-65	E3	0.02	0.01	0.02	0.00	0.05	0.92	0.97	5	0.12	0.01	4.6	4.6	4.7	---	---	---	---	---
-6	65-72	E4	0.03	0.02	0.03	0.00	0.08	2.80	2.88	3	0.15	0.02	4.2	4.5	4.6	---	---	---	---	---
-7	72-80	Bh	0.06	0.04	0.03	0.00	0.13	3.16	3.29	4	0.51	0.02	4.2	4.8	4.4	0.68	0.01	0.15	0.05	0.01

See footnotes at end of table.

TABLE 18.--CHEMICAL ANALYSIS OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Mg	Na	K	Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH*: H_2O (1:1)	$CaCl_2$ 0.01M (1:2)	KCl 1N (1:1)	Pyrophosphate extractable: C	Fe	Al	Citrate-dithionite extractable: Fe	Al
	In		----Milliequivalents/100 grams of soil-----							Pct	Pct	Mmhos/cm				----------Pct----------				
Kershaw fine sand:																				
S87FL-041-009-1	0-5	A	0.53	0.08	0.02	0.02	0.65	4.04	4.69	14	0.68	0.03	4.8	4.6	4.4	---	---	---	---	---
-2	5-25	C1	0.02	0.01	0.01	0.00	0.04	2.10	2.14	2	0.16	0.02	4.5	4.6	4.7	---	---	---	---	---
-3	25-45	C1	0.02	0.01	0.03	0.00	0.06	1.80	1.86	3	0.10	0.02	4.5	4.5	4.7	---	---	---	---	---
-4	45-80	C2	0.03	0.02	0.01	0.00	0.06	1.22	1.28	5	0.06	0.01	4.6	4.4	4.7	---	---	---	---	---
Leon fine sand:																				
S86FL-041-006-1	0-6	Ap	0.50	0.24	0.06	0.02	0.82	6.94	7.76	11	1.43	0.06	3.6	3.5	3.1	---	---	---	---	---
-2	6-15	E1	0.27	0.13	0.04	0.01	0.45	2.44	2.89	16	0.75	0.03	3.9	3.8	3.3	---	---	---	---	---
-3	15-21	E2	0.06	0.05	0.04	0.01	0.16	1.21	1.37	12	0.45	0.02	4.4	3.9	3.9	---	---	---	---	---
-4	21-28	Bh1	0.04	0.04	0.07	0.01	0.16	18.62	18.78	1	2.40	0.05	3.8	3.6	3.8	1.85	0.00	0.13	0.05	0.12
-5	28-40	Bh2	0.06	0.03	0.04	0.01	0.14	9.20	9.34	1	1.16	0.02	3.8	3.6	3.7	0.92	0.01	0.10	0.14	0.10
-6	40-60	BC	0.04	0.03	0.04	0.01	0.12	0.38	0.50	24	0.15	0.01	4.4	4.4	4.4	---	---	---	---	---
-7	60-80	C	0.02	0.01	0.02	0.00	0.05	0.56	0.61	8	0.09	0.01	4.6	4.8	4.9	---	---	---	---	---
Mandarin fine sand:																				
S86FL-041-005-1	0-6	Ap	0.16	0.09	0.03	0.01	0.29	1.51	1.80	16	0.55	0.03	3.9	3.8	3.5	---	---	---	---	---
-2	6-20	E	0.04	0.02	0.02	0.01	0.09	0.42	0.51	18	0.08	0.01	4.7	4.2	4.1	---	---	---	---	---
-3	20-24	Bh1	0.12	0.13	0.06	0.01	0.32	15.95	16.27	2	2.69	0.04	4.1	3.8	3.6	4.26	0.01	0.43	0.03	0.06
-4	24-29	Bh2	0.04	0.04	0.05	0.01	0.14	5.39	5.53	3	1.13	0.03	4.1	4.2	3.7	2.26	0.01	0.46	0.04	0.06
-5	29-59	E'1	0.03	0.02	0.04	0.01	0.10	2.81	2.91	3	0.27	0.02	4.4	4.5	5.0	---	---	---	---	---
-6	59-71	E'2	0.02	0.01	0.04	0.00	0.07	7.92	7.99	1	0.58	0.02	4.2	4.5	4.8	---	---	---	---	---
-7	71-80	B'h	0.02	0.01	0.03	0.01	0.07	19.98	20.05	0	1.50	0.02	4.1	4.4	4.2	2.84	0.00	0.64	0.03	0.06
Meggett fine sand:**																				
S87FL-041-015-1	0-4	A	2.55	0.34	0.05	0.03	2.97	15.61	18.58	16	0.73	0.06	4.9	4.6	4.9	---	---	---	---	---
-2	4-11	E	1.47	0.06	0.04	0.01	1.58	0.69	2.27	70	0.03	0.03	5.3	5.0	5.3	---	---	---	---	---
-3	11-31	Btg1	14.50	0.49	0.20	0.04	15.23	16.60	31.83	48	0.17	0.05	4.3	3.9	3.7	---	---	---	1.12	0.12
-4	31-40	Btg2	12.75	0.22	0.19	0.04	13.20	10.66	23.86	55	0.15	0.05	4.4	4.2	4.0	---	---	---	1.75	0.10
-5	40-60	Cg	41.75	0.24	0.17	0.08	42.24	3.49	45.73	92	0.14	0.17	7.1	6.5	7.3	---	---	---	---	---
-6	60-80	Cg	42.75	0.27	0.17	0.08	43.27	2.44	45.71	95	0.12	0.16	7.1	6.9	7.4	---	---	---	---	---
Ortega fine sand:																				
S87FL-041-008-1	0-6	Ap	0.60	0.09	0.02	0.01	0.72	3.67	4.39	16	0.94	0.02	4.6	4.3	4.2	---	---	---	---	---
-2	6-29	C1	0.10	0.04	0.03	0.01	0.18	1.70	1.88	10	0.30	0.04	4.8	4.6	4.7	---	---	---	---	---
-3	29-52	C1	0.03	0.02	0.02	0.00	0.07	1.62	1.69	4	0.17	0.02	4.6	4.6	4.7	---	---	---	---	---
-4	52-60	C2	0.02	0.01	0.01	0.00	0.04	0.96	1.00	4	0.06	0.01	4.7	4.5	4.8	---	---	---	---	---
-5	60-80	C3	0.02	0.01	0.01	0.00	0.04	0.75	0.79	5	0.05	0.00	5.2	4.8	4.9	---	---	---	---	---

See footnotes at end of table.

TABLE 18.--CHEMICAL ANALYSIS OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Mg	Na	K	Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH* H_2O (1:1)	$CaCl_2$ 0.01M (1:2)	KCl 1N (1:1)	Pyrophosphate extractable: C	Fe	Al	Citrate-dithionite extractable: Fe	Al
	In		----Milliequivalents/100 grams of soil-----							Pct	Pct	Mmhos/cm				----------Pct----------				
Otela sand:																				
S87FL-041-007-1	0-10	Ap	0.38	0.05	0.03	0.01	0.47	3.76	4.23	11	0.77	0.04	5.0	4.2	4.3	---	---	---	---	---
-2	10-32	E1	0.06	0.01	0.01	0.00	0.08	1.46	1.54	5	0.15	0.02	4.6	4.2	4.6	---	---	---	---	---
-3	32-42	E2	0.03	0.01	0.01	0.00	0.05	0.72	0.77	6	0.08	0.02	4.6	4.1	4.6	---	---	---	---	---
-4	42-51	E3	0.01	0.01	0.01	0.00	0.03	0.56	0.59	5	0.05	0.02	4.7	4.2	4.7	---	---	---	---	---
-5	51-62	Bt	1.04	0.09	0.03	0.01	1.17	4.96	6.13	19	0.12	0.03	4.0	3.9	4.1	---	---	---	0.17	0.08
-6	62-80	Btg	5.07	0.16	0.04	0.02	5.29	6.44	11.73	45	0.02	0.03	4.0	4.0	4.0	---	---	---	0.08	0.06
Penney fine sand:																				
S86FL-041-001-1	0-7	A	0.31	0.09	0.03	0.04	0.47	2.42	2.89	16	0.67	0.03	4.7	4.6	4.2	---	---	---	---	---
-2	7-17	E1	0.15	0.04	0.03	0.02	0.24	2.67	2.91	8	0.30	0.01	5.3	4.9	4.6	---	---	---	---	---
-3	17-36	E2	0.12	0.05	0.04	0.02	0.23	1.50	1.73	13	0.16	0.01	5.4	4.9	5.0	---	---	---	---	---
-4	36-56	E2	0.08	0.04	0.03	0.01	0.16	1.18	1.34	12	0.11	0.01	5.1	4.7	4.8	---	---	---	---	---
-5	56-80	E&Bt	0.05	0.04	0.03	0.00	0.12	0.69	0.81	15	0.09	0.01	4.7	4.7	5.0	---	---	---	---	---
Resota fine sand:																				
S87FL-041-017-1	0-5	A	0.42	0.08	0.02	0.03	0.55	3.24	3.79	17	0.95	0.08	4.1	3.6	3.6	---	---	---	---	---
-2	5-12	E	0.15	0.01	0.00	0.00	0.16	0.16	0.32	50	0.14	0.03	4.5	4.4	4.2	---	---	---	---	---
-3	12-16	Bw1	0.10	0.01	0.03	0.01	0.15	5.21	5.36	3	0.68	0.04	4.2	4.3	4.5	---	---	---	---	---
-4	16-26	Bw2	0.09	0.02	0.03	0.01	0.15	2.38	2.53	6	0.22	0.04	4.4	4.5	4.8	---	---	---	---	---
-5	26-55	Bw3	0.05	0.03	0.02	0.00	0.10	1.46	1.56	6	0.04	0.03	4.2	4.4	4.6	---	---	---	---	---
-6	55-80	C	0.06	0.02	0.02	0.00	0.10	0.98	1.08	9	0.02	0.02	4.5	4.5	4.7	---	---	---	---	---
Ridgewood fine sand:																				
S86FL-041-003-1	0-6	Ap	0.13	0.07	0.06	0.01	0.27	4.86	5.13	5	0.96	0.05	4.2	3.8	3.6	---	---	---	---	---
-2	6-25	C1	0.04	0.02	0.03	0.00	0.09	1.74	1.83	5	0.37	0.02	4.8	5.5	4.9	---	---	---	---	---
-3	25-40	C2	0.07	0.05	0.04	0.00	0.16	1.24	1.40	11	0.20	0.02	4.9	5.2	4.8	---	---	---	---	---
-4	40-60	C3	0.04	0.03	0.03	0.00	0.10	0.53	0.63	16	0.10	0.01	5.4	5.2	5.0	---	---	---	---	---
-5	60-80	C3	0.02	0.02	0.08	0.01	0.13	0.31	0.44	30	0.07	0.01	4.9	5.2	5.0	---	---	---	---	---
Sapelo fine sand:																				
S87FL-041-014-1	0-5	A	0.51	0.31	0.07	0.08	0.97	20.00	20.97	5	1.65	0.13	3.5	2.9	3.1	---	---	---	---	---
-2	5-20	E	0.10	0.06	0.03	0.01	0.20	11.98	12.18	2	0.11	0.02	4.1	3.5	3.8	---	---	---	---	---
-3	20-25	Bh	0.08	0.06	0.07	0.02	0.23	25.18	25.41	1	1.20	0.05	3.6	3.3	3.4	1.32	0.02	0.14	0.06	0.10
-4	25-29	BE	0.08	0.06	0.05	0.02	0.21	23.00	23.21	1	0.73	0.04	3.9	3.8	3.7	---	---	---	---	---
-5	29-35	E'	0.02	0.02	0.05	0.01	0.10	17.17	17.27	1	0.29	0.03	4.2	4.0	4.1	---	---	---	---	---
-6	35-41	EB	0.07	0.07	0.11	0.02	0.27	21.61	21.88	1	0.35	0.04	4.2	3.9	4.4	---	---	---	---	---
-7	41-67	Btg1	0.32	0.18	0.17	0.02	0.69	26.03	26.72	3	0.17	0.05	4.0	3.7	4.1	---	---	---	1.62	0.22
-8	67-80	Btg2	1.40	0.26	0.09	0.03	1.78	23.22	25.00	7	0.03	0.03	4.1	3.7	4.0	---	---	---	0.25	0.09

See footnotes at end of table.

TABLE 18.--CHEMICAL ANALYSIS OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Extractable bases: Ca	Extractable bases: Mg	Extractable bases: Na	Extractable bases: K	Extractable bases: Sum	Extractable acidity	Sum of cations	Base saturation	Organic carbon	Electrical conductivity	pH*: H_2O (1:1)	pH*: $CaCl_2$ 0.01M (1:2)	pH*: KCl 1N (1:1)	Pyrophosphate extractable: C	Pyrophosphate extractable: Fe	Pyrophosphate extractable: Al	Citrate-dithionite extractable: Fe	Citrate-dithionite extractable: Al
	In		----Milliequivalents/100 grams of soil-----							Pct	Pct	Mmhos/cm				----------Pct----------				
Shadeville fine sand:																				
S87FL-041-013-1	0-9	Ap	1.02	0.27	0.02	0.10	1.41	3.10	4.51	31	0.76	0.04	4.9	4.4	4.5	---	---	---	---	---
-2	9-21	E1	0.10	0.02	0.02	0.03	0.17	3.00	3.17	5	0.20	0.02	4.5	4.2	3.8	---	---	---	---	---
-3	21-32	E2	0.14	0.08	0.02	0.03	0.27	2.33	2.60	10	0.14	0.02	4.7	4.4	4.2	---	---	---	---	---
-4	32-38	Bt	5.52	1.07	0.05	0.06	6.70	4.34	11.04	61	0.11	0.03	4.9	4.8	4.6	---	---	---	0.06	0.03
-5	38-42	Btg	18.75	0.99	1.30	0.82	21.86	2.80	24.66	89	0.32	0.22	6.2	6.4	6.5	---	---	---	0.06	0.03

* Some of the pH levels are slightly more acid than is allowed in the series. Field data on pH levels were used for some horizons in the typical pedons of Albany, Blanton, Eunola, Garcon, Meggett, and Ridgewood soils.

** The soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.

TABLE 19.--CLAY MINERALOGY OF SELECTED SOILS

[The pedons for all of the soils listed are typical of the series in the survey area. For the location of the sample site, see the series description in the section "Soil Series and Their Morphology"]

Soil name and sample number	Depth	Horizon	Clay minerals: Montmorillonite	14-angstrom intergrade	Kaolinite	Quartz
	In		Pct	Pct	Pct	Pct
Albany fine sand:						
S87FL-041-011-1	0-7	A	0	35	41	24
-4	41-60	Btg1	0	24	63	13
-5	60-80	Btg2	0	28	62	10
Blanton fine sand:						
S87FL-041-012-1	0-6	A	0	28	56	16
-4	44-60	Bt	0	21	73	6
-5	60-80	Btg	0	21	70	9
Eunola fine sand:						
S87FL-014-018-1	0-9	Ap	0	15	66	19
-3	19-26	Bt1	0	11	81	8
-6	63-80	Cg	0	0	89	11
Garcon fine sand:						
S87FL-041-016-1	0-7	A	0	24	38	38
-4	29-40	Bt1	16	17	53	14
-6	58-80	C	35	14	42	9
Hurricane fine sand:						
S86FL-041-004-1	0-6	Ap	0	49	17	34
-6	65-72	E4	0	45	17	38
-7	72-80	Bh	0	0	0	100
Kershaw fine sand:						
S87FL-041-009-1	0-5	A	0	37	32	31
-3	5-25	C1	0	38	34	28
-4	45-80	C2	0	35	42	23
Leon fine sand:						
S86FL-041-006-1	0-6	Ap	0	14	14	72
-4	21-28	Bh1	0	18	13	69
-7	60-80	C	0	55	18	27
Mandarin fine sand:						
S86FL-041-005-1	0-6	Ap	0	13	12	75
-3	20-24	Bh1	0	32	14	54
-5	29-59	E'1	0	40	14	46
-7	71-80	B'h	0	12	8	80
Meggett fine sand:*						
S87FL-041-015-1	0-4	A	40	14	22	24
-3	11-31	Btg1	71	8	14	7
-5	40-60	Cg	64	7	26	3
Ortega fine sand:						
S87FL-041-008-1	0-6	Ap	0	33	17	50
-3	29-52	C2	0	41	13	46
-5	60-80	C3	0	28	9	51

See footnote at end of table.

TABLE 19.--CLAY MINERALOGY OF SELECTED SOILS--Continued

Soil name and sample number	Depth	Horizon	Clay minerals: Montmo- rillonite	14-angstrom intergrade	Kaolinite	Quartz
	In		Pct	Pct	Pct	Pct
Otela sand:						
S87FL-041-007-1	0-10	Ap	0	28	55	17
-5	51-62	Bt	0	13	75	12
-6	62-80	Btg	0	12	79	9
Penney fine sand:						
S86FL-041-001-1	0-7	A	0	34	43	23
-5	56-80	E&Bt	0	40	46	14
Resota fine sand:						
S87FL-014-017-1	0-5	A	23	12	25	40
-3	12-16	Bw1	10	31	22	37
-6	55-80	C	16	31	21	32
Ridgewood fine sand:						
S86FL-041-003-1	0-6	Ap	0	53	17	30
-3	25-40	C2	0	42	10	48
-5	60-80	C3	0	49	9	42
Sapelo fine sand:						
S87FL-041-014-1	0-5	A	0	0	0	100
-3	20-25	Bh	0	15	26	59
-6	35-41	EB	27	16	27	30
-8	67-80	Btg2	67	9	15	9
Shadeville fine sand:						
S87FL-041-013-1	0-9	Ap	10	28	47	15
-4	32-38	Bt	5	7	80	8
-5	38-42	Btg	24	7	63	6

* The soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.

TABLE 20.--ENGINEERING INDEX TEST DATA

[Tests were performed by the Florida Department of Transportation in cooperation with the U.S Bureau of Public Roads. See the section "Soil Series and Their Morphology" for the location of the pedon sampled. Dashes indicate that data were not available. NP means nonplastic]

Soil name, sample number, horizon, and depth in inches	Classification		Grain-size distribution								Liquid limit	Plasticity index	Moisture density	
			Percentage passing sieve--				Percentage smaller than--							
	AASHTO	Unified	No. 4	No. 10	No. 40	No. 200	.05 mm	.02 mm	.005 mm	.002 mm			Maximum dry density	Optimum moisture
											Pct		Lb/ cu ft	Pct
Albany fine sand: S87FL-041-011(5)														
Btg2------ 60 to 80	A-2-4(0)	SM	100	100	97	19	19	18	16	16	22	4	115.5	13.2
Blanton fine sand: S87FL-041-012(5)														
Btg------- 60 to 80	A-7-6(10)	CL	100	100	91	55	50	42	37	36	45	24	110.0	16.6
Eunola fine sand: S87FL-014-018(4)														
Bt2------- 26 to 35	A-2-6(1)	SC	100	100	99	33	33	29	29	28	29	12	110.7	15.5
Garcon fine sand: S87FL-041-016(5)														
Bt2------- 40 to 58	A-6(2)	SC	100	100	45	41	36	30	30	30	36	14	109.7	15.6
Hurricane fine sand: S86FL-041-004(4, 5)														
E3-------- 29 to 65	A-3(0)	SP	100	100	97	3	3	2	1	0	---	NP	106.6	11.2
Kershaw fine sand: S87FL-041-009(4)														
C2-------- 45 to 80	A-3(0)	SP	100	100	98	3	3	3	2	2	---	NP	104.4	13.6
Leon fine sand: S86FL-041-006(4, 5)														
Bh1, Bh2-- 21 to 40	A-3(0)	SP-SM	100	100	95	6	6	4	2	2	---	NP	109.0	11.2
Mandarin fine sand: S86FL-041-005(3, 4, 5)														
Bh1, Bh2-- 20 to 29	A-3(0)	SP-SM	100	100	97	10	4	4	4	4	---	NP	106.5	13.2
E'1------- 29 to 59	A-3(0)	SP-SM	100	100	97	10	4	4	4	4	---	NP	109.6	11.2
Meggett fine sand:* S87FL-041-005(3)														
Btg1------ 11 to 31	A-7-6(10)	SC	100	100	97	50	48	42	40	39	47	29	97.0	11.7
Ortega fine sand: S87FL-041-008(4)														
C2-------- 52 to 60	A-3(0)	SP-SM	100	100	98	5	4	4	3	1	---	NP	106.8	10.8
Otela sand: S87FL-041-007(2, 6)														
E1-------- 10 to 32	A-3(0)	SP-SM	100	100	91	10	7	5	2	2	---	NP	112.8	10.4
Btg------- 62 to 80	A-7-6(6)	SC	100	100	95	49	48	47	45	44	49	30	99.3	18.3
Penney fine sand: S86FL-041-001(5)														
E&Bt------ 56 to 80	A-3(0)	SP	100	100	91	4	3	1	1	1	---	NP	106.9	11.3

* See footnote at end of table.

TABLE 20.--ENGINEERING INDEX TEST DATA--Continued

Soil name, sample number, horizon, and depth in inches	Classification		Grain-size distribution								Liquid limit	Plasticity index	Moisture density	
			Percentage passing sieve--				Percentage smaller than--							
	AASHTO	Unified	No. 4	No. 10	No. 40	No. 200	.05 mm	.02 mm	.005 mm	.002 mm			Maximum dry density	Optimum moisture
											Pct		Lb/ cu ft	Pct
Resota fine sand:														
S87FL-041-017(6)														
C--------- 55 to 80	A-3(0)	SP	100	100	95	10	5	4	3	3	---	NP	105.6	10.6
Ridgewood fine sand:														
S86FL-041-003(3)														
C2-------- 25 to 40	A-3(0)	SP	100	100	98	3	3	2	1	0	---	NP	107.4	11.2
Sapelo fine sand:														
S87FL-041-014(2, 7)														
E--------- 5 to 20	A-3(0)	SP-SM	100	100	96	8	7	4	3	1	---	NP	105.5	11.8
Btg1------ 41 to 67	A-2-4(0)	SC	100	100	95	23	22	20	18	17	28	9	114.6	14.0
Shadeville fine sand:														
S87FL-041-013(4)														
Bt-------- 32 to 38	A-2-6(1)	SC	100	100	99	32	30	28	27	27	31	14	114.7	13.1

* The soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.

TABLE 21.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Albany	Loamy, siliceous, thermic Grossarenic Paleudults
Allanton	Sandy, siliceous, thermic Grossarenic Haplaquods
Alpin	Thermic, coated Typic Quartzipsamments
Blanton	Loamy, siliceous, thermic Grossarenic Paleudults
Bonneau	Loamy, siliceous, thermic Arenic Paleudults
Dorovan	Dysic, thermic Typic Medisaprists
Elloree	Loamy, siliceous, thermic Arenic Ochraqualfs
Eunola	Fine-loamy, siliceous, thermic Aquic Hapludults
Fluvaquents	Nonacid Fluvaquents
Garcon	Loamy, siliceous, thermic Arenic Hapludults
Hurricane	Sandy, siliceous, thermic Grossarenic Entic Haplohumods
Kershaw	Thermic, uncoated Typic Quartzipsamments
Leon	Sandy, siliceous, thermic Aeric Haplaquods
Lynn Haven	Sandy, siliceous, thermic Typic Haplaquods
Mandarin	Sandy, siliceous, thermic Typic Haplohumods
*Meggett	Fine, mixed, thermic Typic Albaqualfs
Ortega	Thermic, uncoated Typic Quartzipsamments
Osier	Siliceous, thermic Typic Psammaquents
Otela	Loamy, siliceous, thermic Grossarenic Paleudalfs
Pamlico	Sandy or sandy-skeletal, siliceous, dysic, thermic Terric Medisaprists
Penney	Thermic, uncoated Typic Quartzipsamments
Pottsburg	Sandy, siliceous, thermic Grossarenic Haplaquods
Quartzipsamments	Quartzipsamments
Resota	Thermic, uncoated Spodic Quartzipsamments
Ridgewood	Thermic, uncoated Aquic Quartzipsamments
Sapelo	Sandy, siliceous, thermic Ultic Haplaquods
Shadeville	Loamy, siliceous, thermic Arenic Hapludalfs
Surrency	Loamy, siliceous, thermic Arenic Umbric Paleaquults
Wadley	Loamy, siliceous, thermic Grossarenic Paleudults
Wesconnett	Sandy, siliceous, thermic Typic Haplaquods

* The soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.

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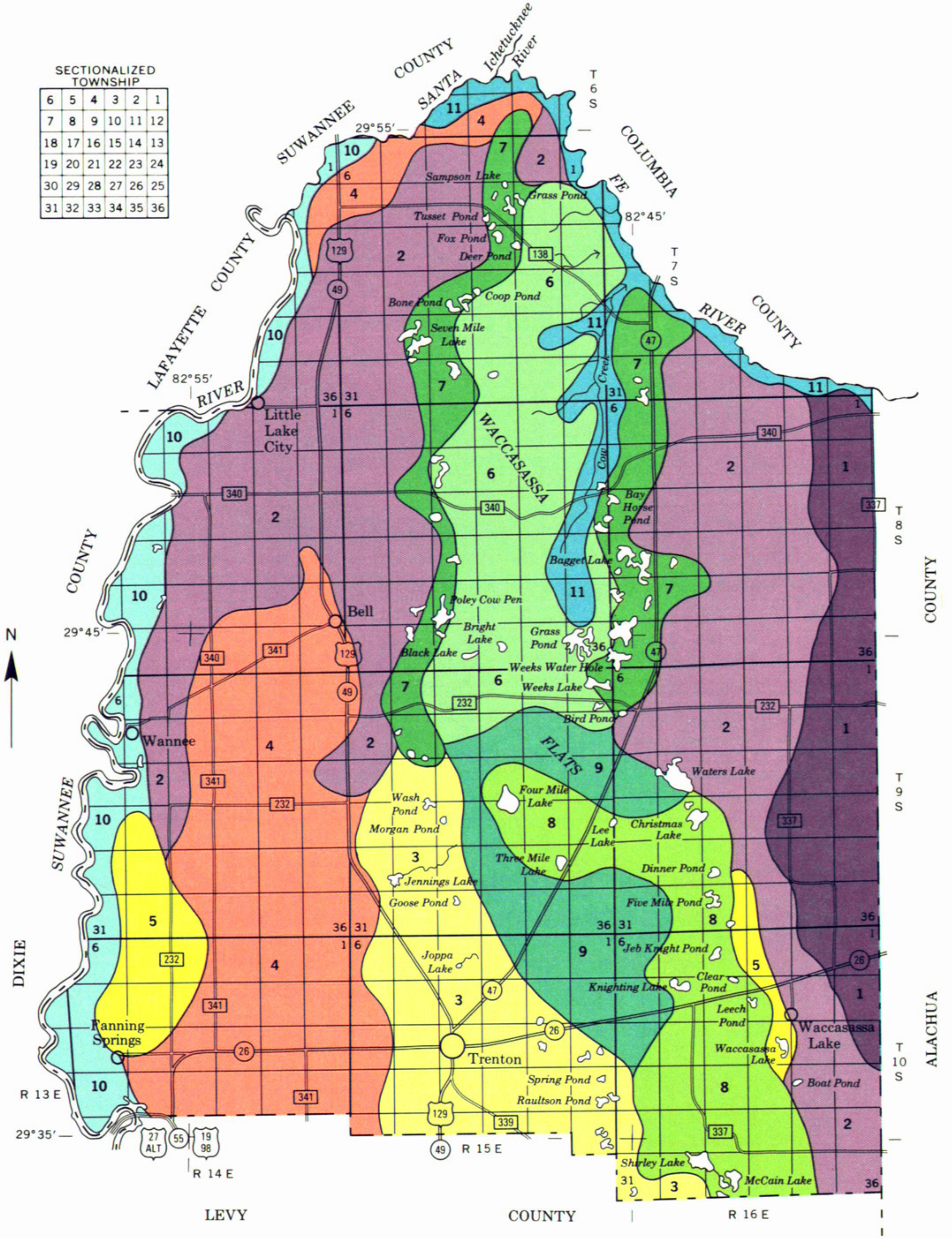

Each area outlined on this map consists of more than one kind of soil. The map is thus meant for general planning rather than a basis for decisions on the use of specific tracts.

SOIL LEGEND

SOILS IN SANDY AREAS ON UPLANDS

1 ALPIN-WADLEY: Nearly level and gently sloping, excessively drained and well drained soils that are sandy throughout or have a sandy surface layer and subsurface layer and a loamy subsoil

2 PENNEY-KERSHAW: Nearly level to moderately sloping, excessively drained soils that have thin lamellae of loamy fine sand in the lower part of the underlying material or are sandy throughout

SOILS ON SLIGHT KNOLLS AND UPLANDS

3 BONNEAU-BLANTON-EUNOLA: Nearly level and gently sloping, moderately well drained soils that have a sandy surface layer and subsurface layer and a loamy subsoil

4 PENNEY-OTELA: Nearly level and gently sloping, excessively drained and moderately well drained soils that are sandy and have thin lamellae of loamy fine sand in the lower part of the underlying material or have a sandy surface layer and subsurface layer and a loamy subsoil

5 WADLEY-BLANTON: Nearly level and gently sloping, well drained and moderately well drained soils that have a sandy surface layer and subsurface layer and a loamy subsoil

SOILS IN DEPRESSIONS, ON FLATWOODS, ON SLIGHT KNOLLS, AND IN TRANSITIONAL AREAS BETWEEN THE UPLANDS AND FLATWOODS

6 LYNN HAVEN-RIDGEWOOD: Nearly level, very poorly drained and somewhat poorly drained soils that have a sandy surface layer and a sandy subsoil coated with organic material or that are sandy throughout

7 ORTEGA-RIDGEWOOD: Nearly level and gently sloping, moderately well drained and somewhat poorly drained soils that are sandy throughout

8 WESCONNETT-LYNN HAVEN-RIDGEWOOD: Nearly level and gently sloping, very poorly drained and somewhat poorly drained soils that have a sandy surface layer and a sandy subsoil coated with organic material or that are sandy throughout

9 LEON-WESCONNETT-SAPELO: Nearly level, poorly drained and very poorly drained soils that are sandy throughout and have a subsoil coated with organic material or that have a sandy surface layer and subsurface layer, a sandy subsoil, and a loamy substratum

SOILS ON STREAM TERRACES AND FLOOD PLAINS

10 GARCON-ELLOREE-OSIER-FLUVAQUENTS: Nearly level and gently sloping, somewhat poorly drained to very poorly drained soils that have a sandy surface layer and subsurface layer and a loamy subsoil, are sandy throughout, or have loamy and sandy strata

11 FLUVAQUENTS-ELLOREE: Nearly level, poorly drained and very poorly drained soils that have loamy and sandy strata or are sandy throughout

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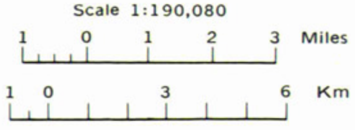
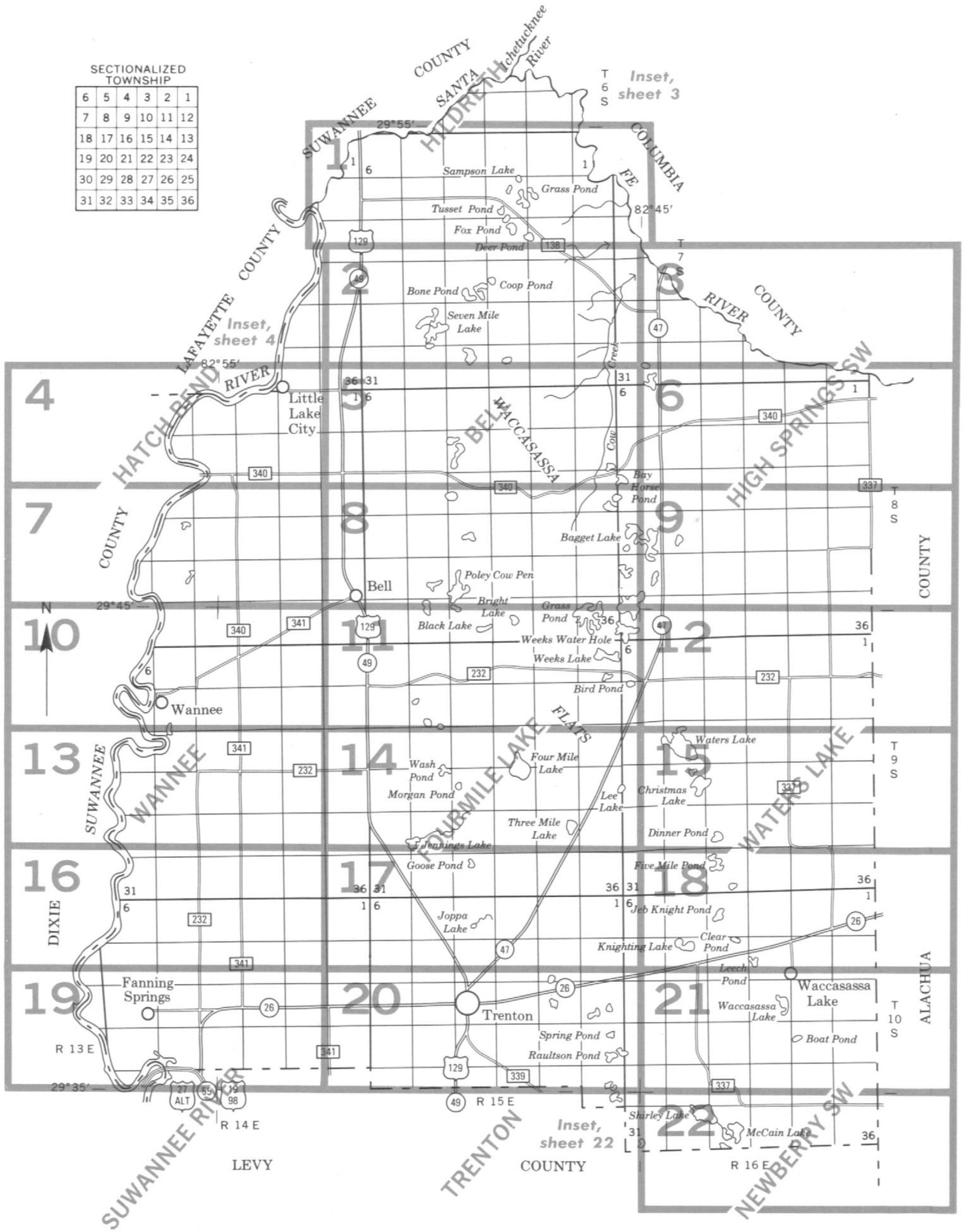
SOIL CONSERVATION SERVICE
UNIVERSITY OF FLORIDA
INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES
AGRICULTURAL EXPERIMENT STATIONS
SOIL SCIENCE DEPARTMENT
FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

GENERAL SOIL MAP

GILCHRIST COUNTY, FLORIDA

Scale 1:190,080



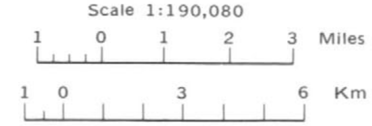


Original text from each individual map sheet read:
This soil survey map was compiled by the U.S. Department of Agriculture, Soil Conservation Service, and cooperating agencies. Base maps are from 1983 – 1984 aerial photography. Coordinate grid ticks and land division corners, if shown, are approximately positioned.

INDEX TO MAP SHEETS

GILCHRIST COUNTY, FLORIDA

Scale 1:190,080



U.S. DEPARTMENT OF AGRICULTURE
SOIL CONSERVATION SERVICE

UNIVERSITY OF FLORIDA
INSTITUTE OF FOOD AND AGRICULTURAL SCIENCES
AGRICULTURAL EXPERIMENT STATIONS
SOIL SCIENCE DEPARTMENT
FLORIDA DEPARTMENT OF AGRICULTURE AND CONSUMER SERVICES

SOIL LEGEND

Soil map unit names without a slope designation are for either nearly level soils, or for miscellaneous areas.

(NUMERICAL LIST)

SYMBOL	NAME
2	Penney fine sand, 0 to 5 percent slopes
3	Penney fine sand, 5 to 8 percent slopes
4	Otela-Penney fine sands, 0 to 5 percent slopes
5	Resota fine sand, 0 to 5 percent slopes, occasionally flooded
6	Ridgewood fine sand, 0 to 5 percent slopes
7	Leon fine sand
8	Lynn Haven and Allanton mucky fine sands, depressional
9	Hurricane fine sand, 0 to 5 percent slopes
10	Garcon fine sand, 0 to 5 percent slopes, occasionally flooded
11	Ortega fine sand, 0 to 5 percent slopes
12	Albany fine sand, 0 to 5 percent slopes
13	Wadley fine sand, 0 to 5 percent slopes
14	Pottsburg fine sand
15	Blanton fine sand, 0 to 5 percent slopes
16	Elloree-Osier-Fluvaquents complex, frequently flooded
18	Kershaw fine sand, gently rolling
19	Sapelo fine sand
20	Pamlico-Dorovan mucks, frequently flooded
21	Bonneau fine sand, 0 to 5 percent slopes
22	Mandarin fine sand
24	Quartzipsamments, excavated
25	Wesconnett mucky fine sand, depressional
26	Surrency mucky fine sand, depressional
27	Leon fine sand, frequently flooded
29	Shadeville-Otela fine sands, 0 to 5 percent slopes
30	Fluvaquents, frequently flooded
32	Meggett fine sand, frequently flooded
33	Eunola-Bonneau fine sands, 0 to 5 percent slopes
34	Bonneau-Blanton fine sands, 0 to 5 percent slopes
35	Alpin fine sand, 0 to 5 percent slopes

(ALPHABETICAL LIST)

SYMBOL	NAME
12	Albany fine sand, 0 to 5 percent slopes
35	Alpin fine sand, 0 to 5 percent slopes
15	Blanton fine sand, 0 to 5 percent slopes
21	Bonneau fine sand, 0 to 5 percent slopes
34	Bonneau-Blanton fine sands, 0 to 5 percent slopes
17	Elloree-Osier-Fluvaquents complex, frequently flooded
33	Eunola-Bonneau fine sands, 0 to 5 percent slopes
30	Fluvaquents, frequently flooded
10	Garcon fine sand, 0 to 5 percent slopes, occasionally flooded
9	Hurricane fine sand, 0 to 5 percent slopes
18	Kershaw fine sand, gently rolling
7	Leon fine sand
27	Leon fine sand, frequently flooded
8	Lynn Haven and Allanton mucky fine sands, depressional
22	Mandarin fine sand
32	Meggett fine sand, frequently flooded
11	Ortega fine sand, 0 to 5 percent slopes
4	Otela-Penney fine sands, 0 to 5 percent slopes
20	Pamlico-Dorovan mucks, frequently flooded
2	Penney fine sand, 0 to 5 percent slopes
3	Penney fine sand, 5 to 8 percent slopes
14	Pottsburg fine sand
24	Quartzipsamments, excavated
5	Resota fine sand, 0 to 5 percent slopes, occasionally flooded
6	Ridgewood fine sand, 0 to 5 percent slopes
19	Sapelo fine sand
29	Shadeville-Otela fine sands, 0 to 5 percent slopes
26	Surrency mucky fine sand, depressional
13	Wadley fine sand, 0 to 5 percent slopes
25	Wesconnett mucky fine sand, depressional

CONVENTIONAL AND SPECIAL SYMBOLS LEGEND

CULTURAL FEATURES

BOUNDARIES

- National, state or province
- County or parish
- Minor civil division
- Reservation (national forest or park, state forest or park, and large airport)
- Land grant
- Limit of soil survey (label)
- Field sheet matchline and neatline

AD HOC BOUNDARY (label)

- Small airport, airfield, park, oilfield, cemetery, or flood pool (Swift Airport; FLOOD POOL LINE)

STATE COORDINATE TICK

LAND DIVISION CORNER (sections and land grants)

ROADS

- Divided (median shown if scale permits)
- Other roads
- Trail

ROAD EMBLEM & DESIGNATIONS

- Interstate (21)
- Federal (173)
- State (28)
- County, farm or ranch (1283)

RAILROAD

POWER TRANSMISSION LINE (normally not shown)

PIPE LINE (normally not shown)

FENCE (normally not shown)

LEVEES

- Without road
- With road
- With railroad

DAMS

- Large (to scale)
- Medium or Small (water; w)

PITS

- Gravel pit
- Mine or quarry

MISCELLANEOUS CULTURAL FEATURES

- Farmstead, house (omit in urban areas)
- Church
- School
- Indian mound (label) (Indian Mound)
- Located object (label) (Tower)
- Tank (label) (Gas)
- Wells, oil or gas
- Windmill
- Kitchen midden

WATER FEATURES

DRAINAGE

- Perennial, double line
- Perennial, single line
- Intermittent
- Drainage end
- Canals or ditches
  - Double-line (label) (CANAL)
  - Drainage and/or irrigation

LAKES, PONDS AND RESERVOIRS

- Perennial (water; w)
- Intermittent (int; i)

MISCELLANEOUS WATER FEATURES

- Marsh or swamp
- Spring
- Well, artesian
- Well, irrigation
- Wet spot

SPECIAL SYMBOLS FOR SOIL SURVEY

SOIL DELINEATIONS AND SYMBOLS (12; 35)

ESCARPMENTS

- Bedrock (points down slope)
- Other than bedrock (points down slope)

SHORT STEEP SLOPE

GULLY

DEPRESSION OR SINK

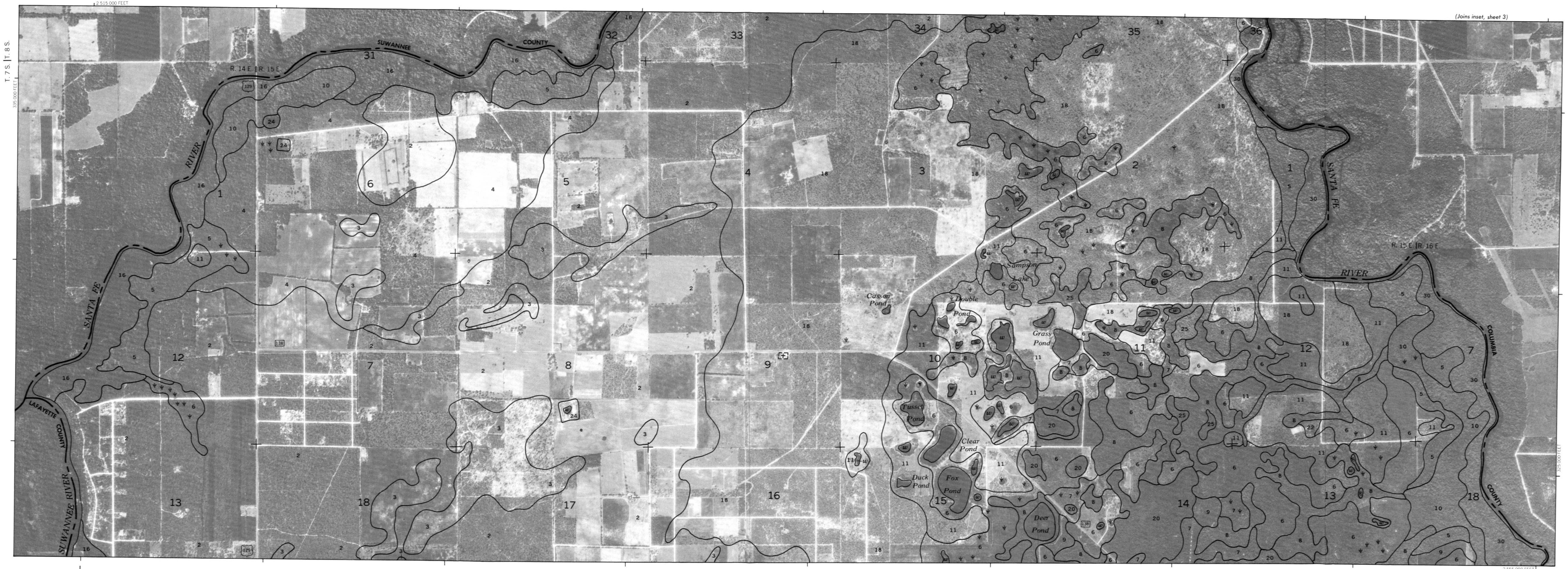
SOIL SAMPLE (normally not shown) (S)

MISCELLANEOUS

- Blowout
- Clay spot
- Gravelly spot
- Gumbo, slick or scabby spot (sodic)
- Dumps and other similar non soil areas
- Prominent hill or peak
- Rock outcrop (includes sandstone and shale)
- Saline spot
- Sandy spot
- Severely eroded spot
- Slide or slip (tips point upslope)
- Stony spot, very stony spot

1

N



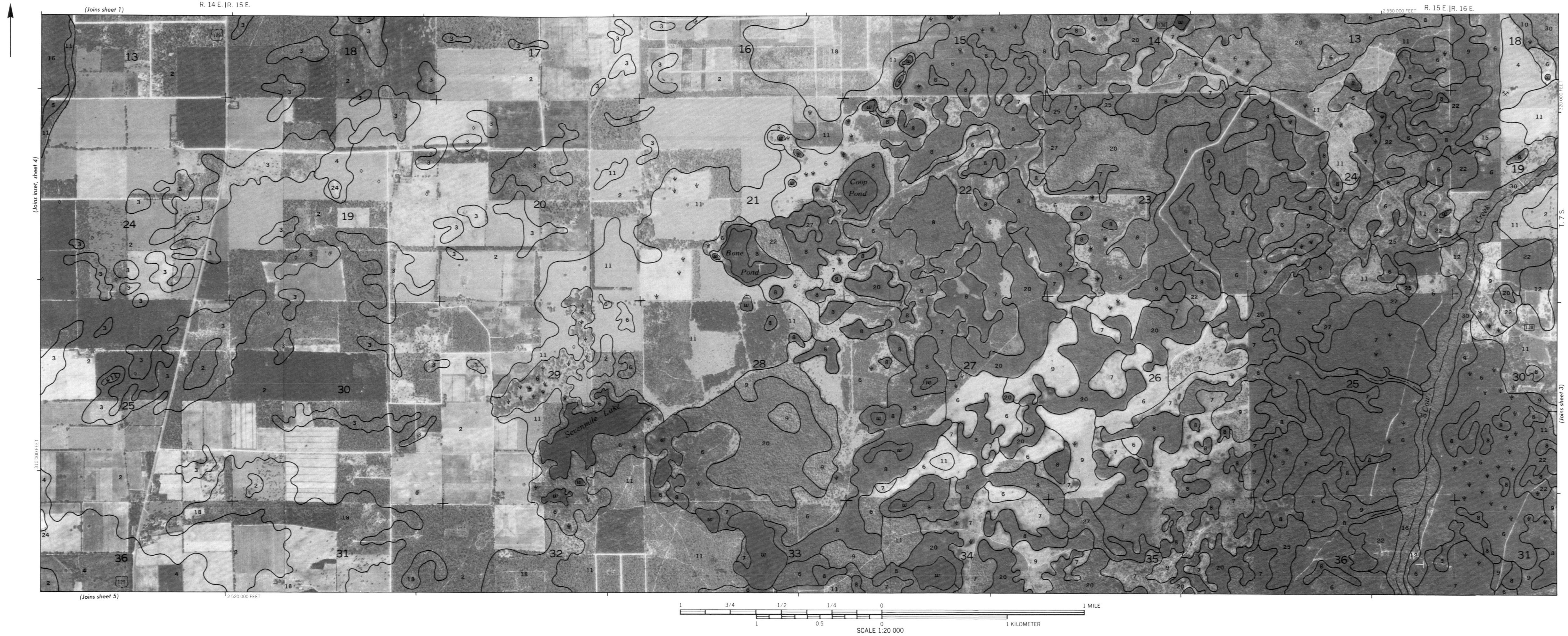
(Joins inset, sheet 4) | (Joins sheet 2)

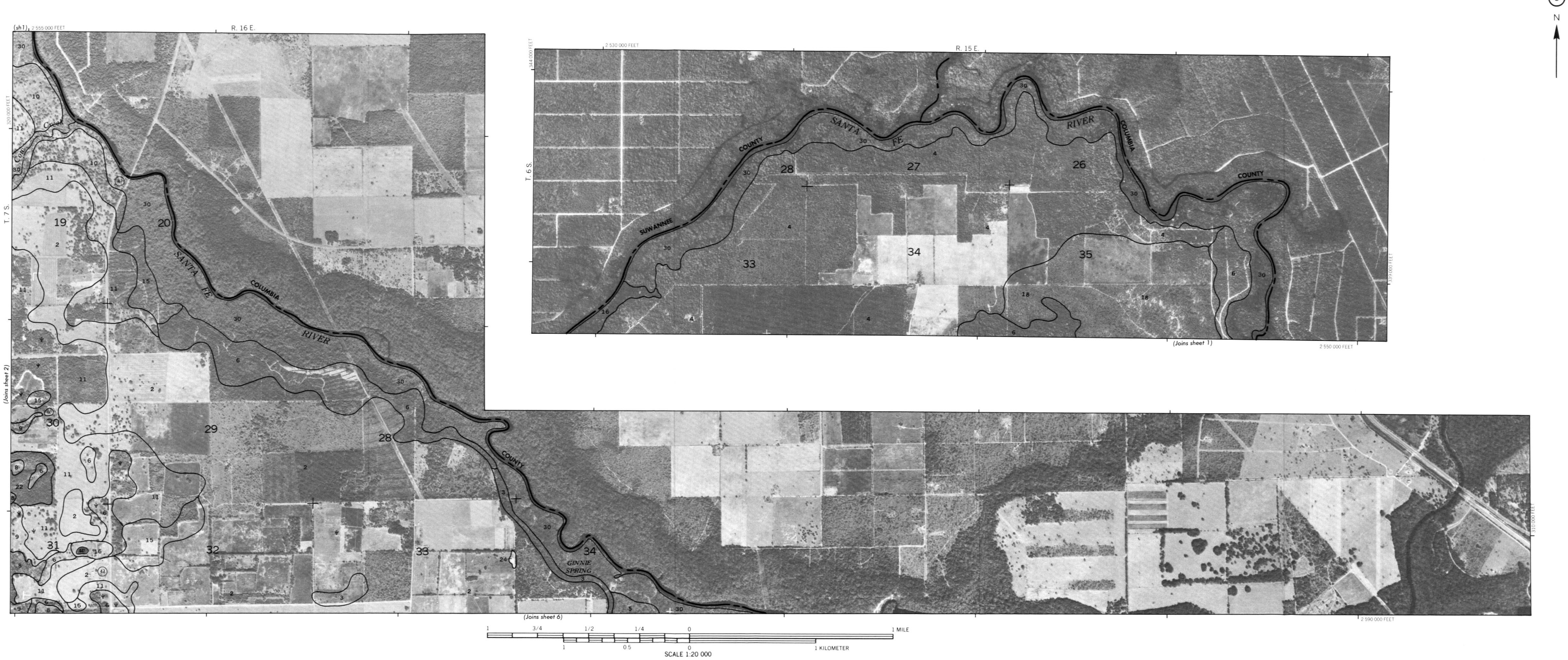
1 3/4 1/2 1/4 0 1 MILE

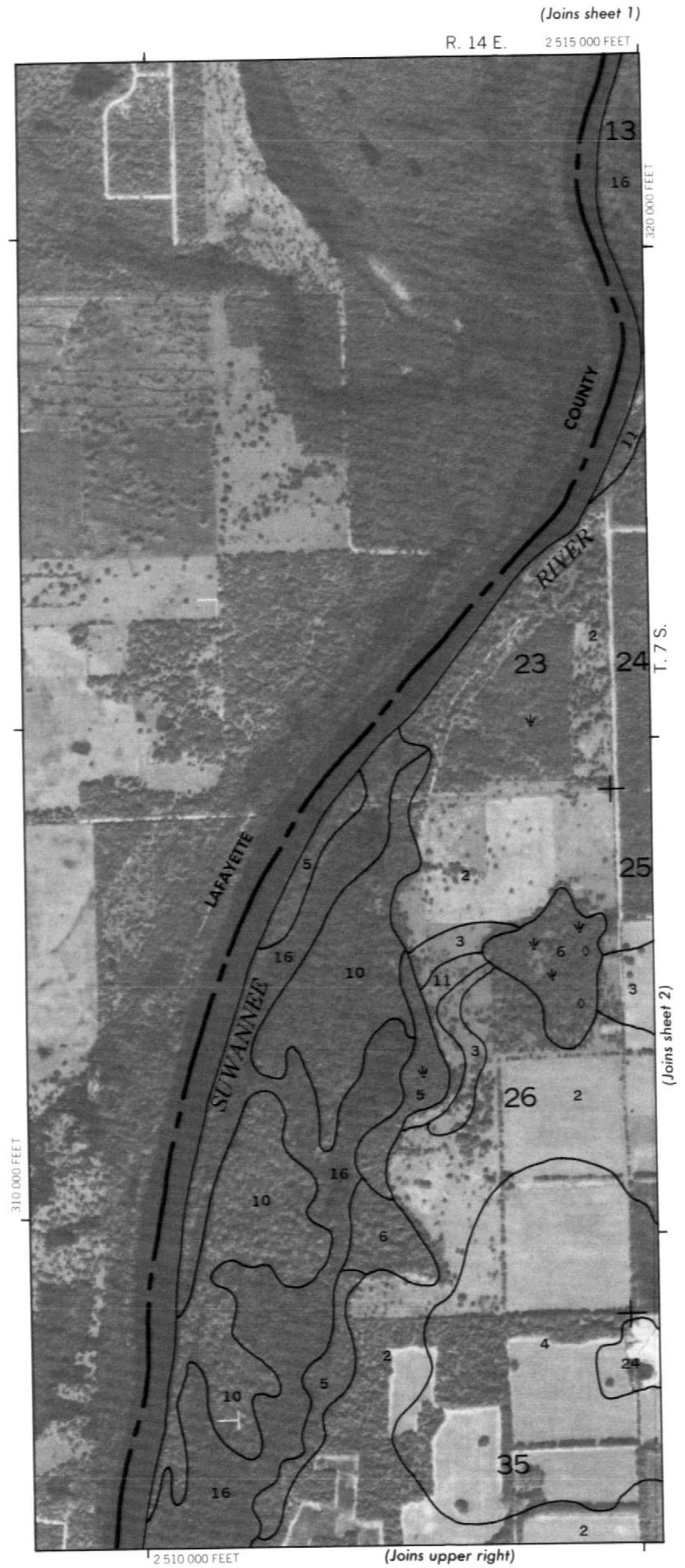
1 0.5 0 1 KILOMETER

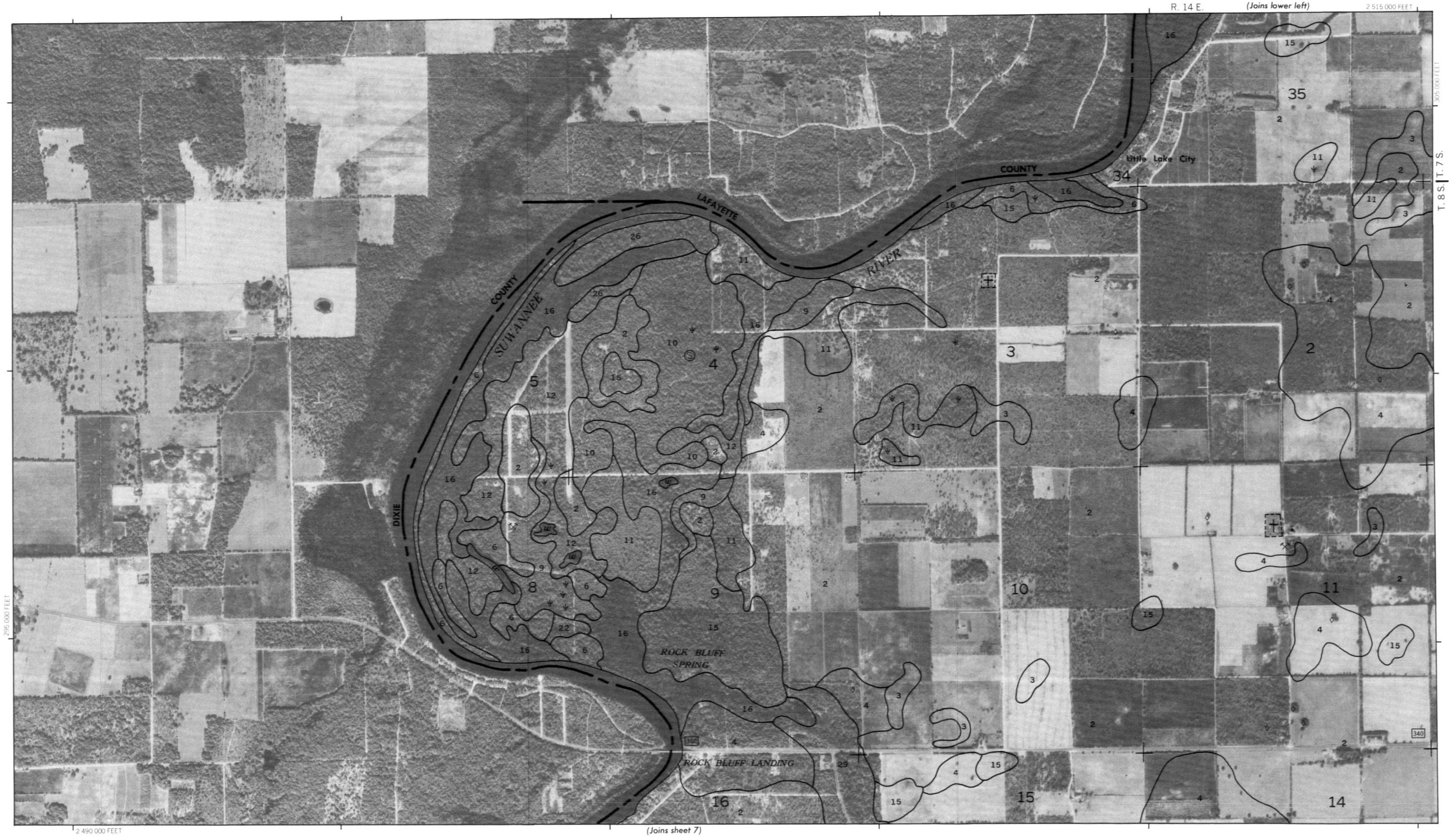
SCALE 1:20 000

(Joins sheet 2) | (Joins inset, sheet 3)


2
N
(Joins sheet 1)
R. 14 E. | R. 15 E.
R. 15 E. | R. 16 E.
2 550 000 FEET
(Joins inset, sheet 4)
(Joins sheet 3)
(Joins sheet 5)
2 520 000 FEET
310 000 FEET
320 000 FEET
T. 7 S.
Coop Pond
Bone Pond
Sevenmile Lake
Cow Creek
1 MILE
1 KILOMETER
SCALE 1:20 000


3
N
R. 16 E.
R. 15 E.
T. 7 S.
T. 6 S.
2 555 000 FEET
2 530 000 FEET
2 550 000 FEET
2 590 000 FEET
SANTA
FE
RIVER
COLUMBIA
COUNTY
SUWANNEE
GINNIE
SPRING
(Joins sheet 1)
(Joins sheet 2)
(Joins sheet 6)
1
3/4
1/2
1/4
0
1 MILE
1
0.5
0
1 KILOMETER
SCALE 1:20 000





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1 0.5 0 1 KILOMETER
SCALE 1:20 000

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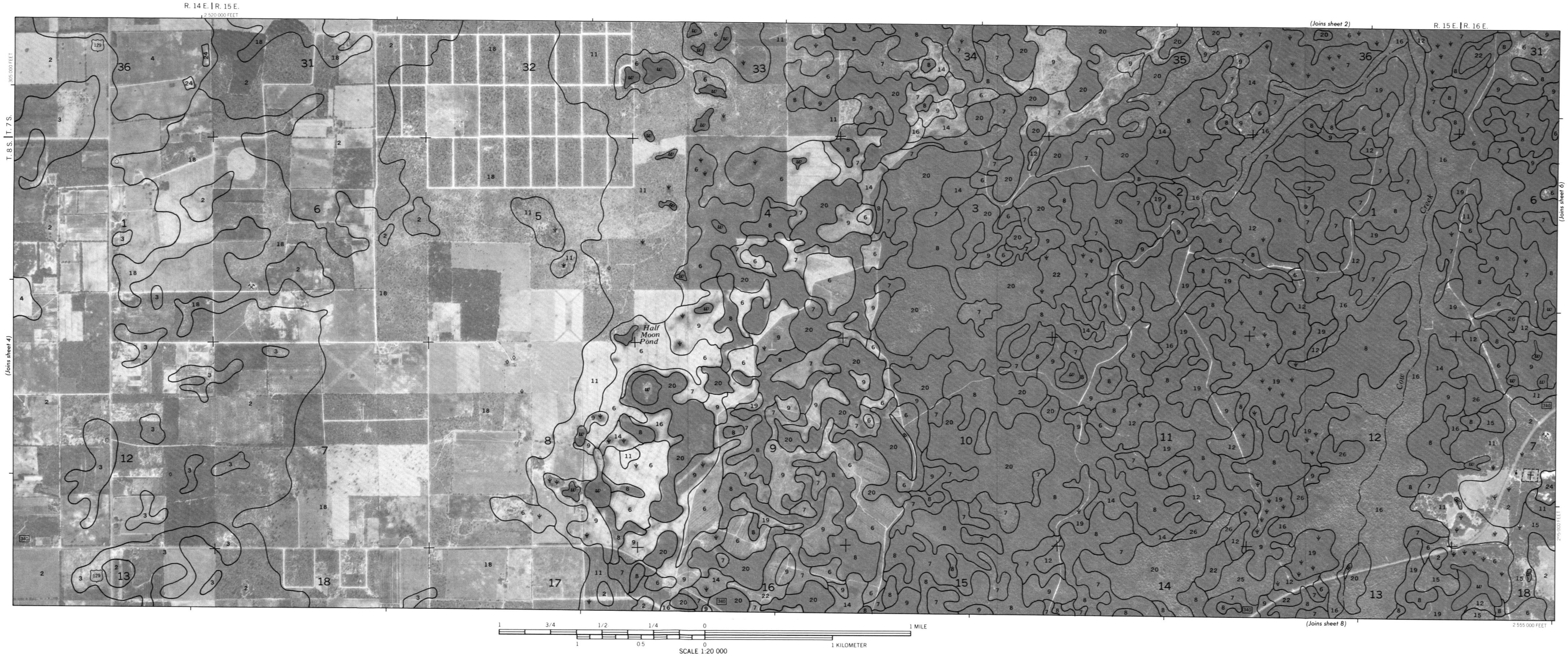
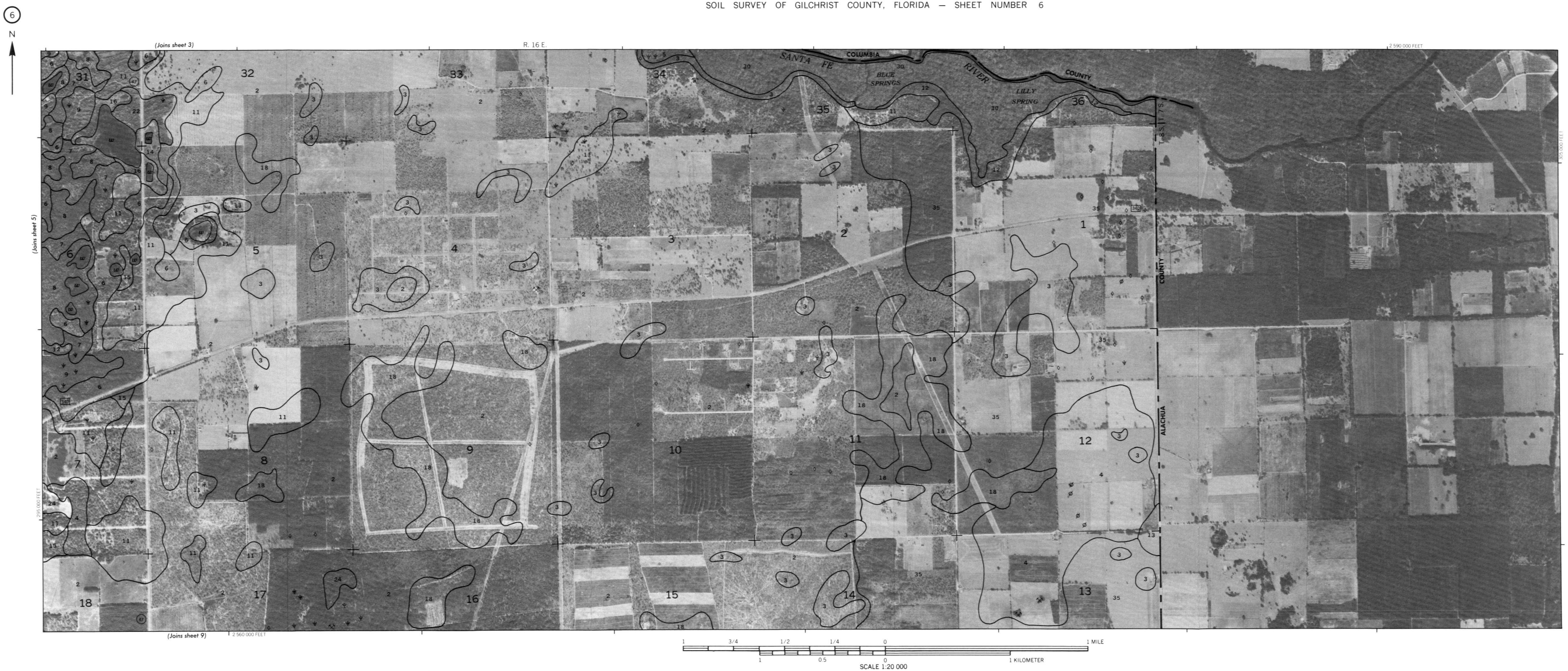
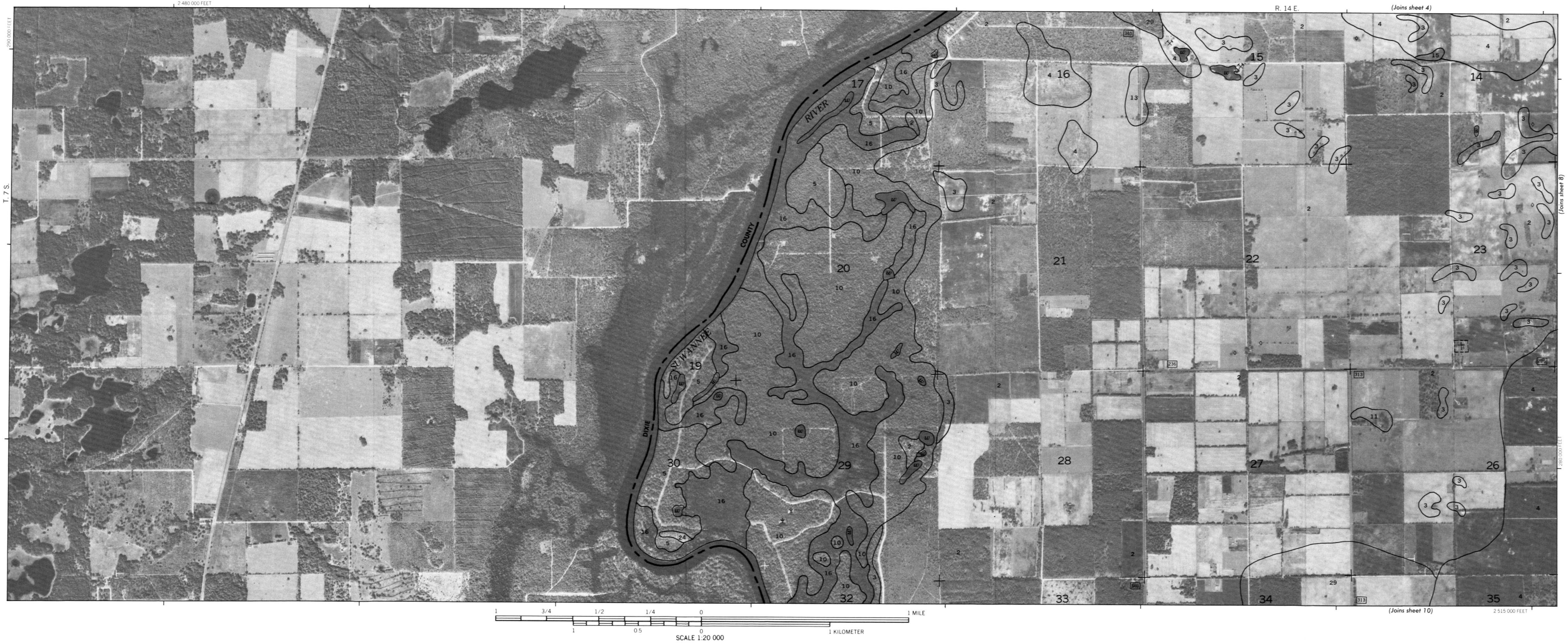

R. 14 E. | R. 15 E.
2 520 000 FEET
305 000 FEET
T. 8 S. | T. 7 S.
(Joins sheet 2)
R. 15 E. | R. 16 E.
(Joins sheet 4)
(Joins sheet 6)
(Joins sheet 8)
Half Moon Pond
Cow Creek
2 555 000 FEET
275 000 FEET
1 3/4 1/2 1/4 0 1 MILE
1 0.5 0 1 KILOMETER
SCALE 1:20 000


6
N
(Joins sheet 3)
R. 16 E.
2 590 000 FEET
(Joins sheet 5)
SANTA FE RIVER
COLUMBIA COUNTY
BLUE SPRINGS
LILLY SPRING
T. 8 S.
ALACHUA COUNTY
305 000 FEET
295 000 FEET
(Joins sheet 9)
2 560 000 FEET
1 MILE
1 KILOMETER
SCALE 1:20 000

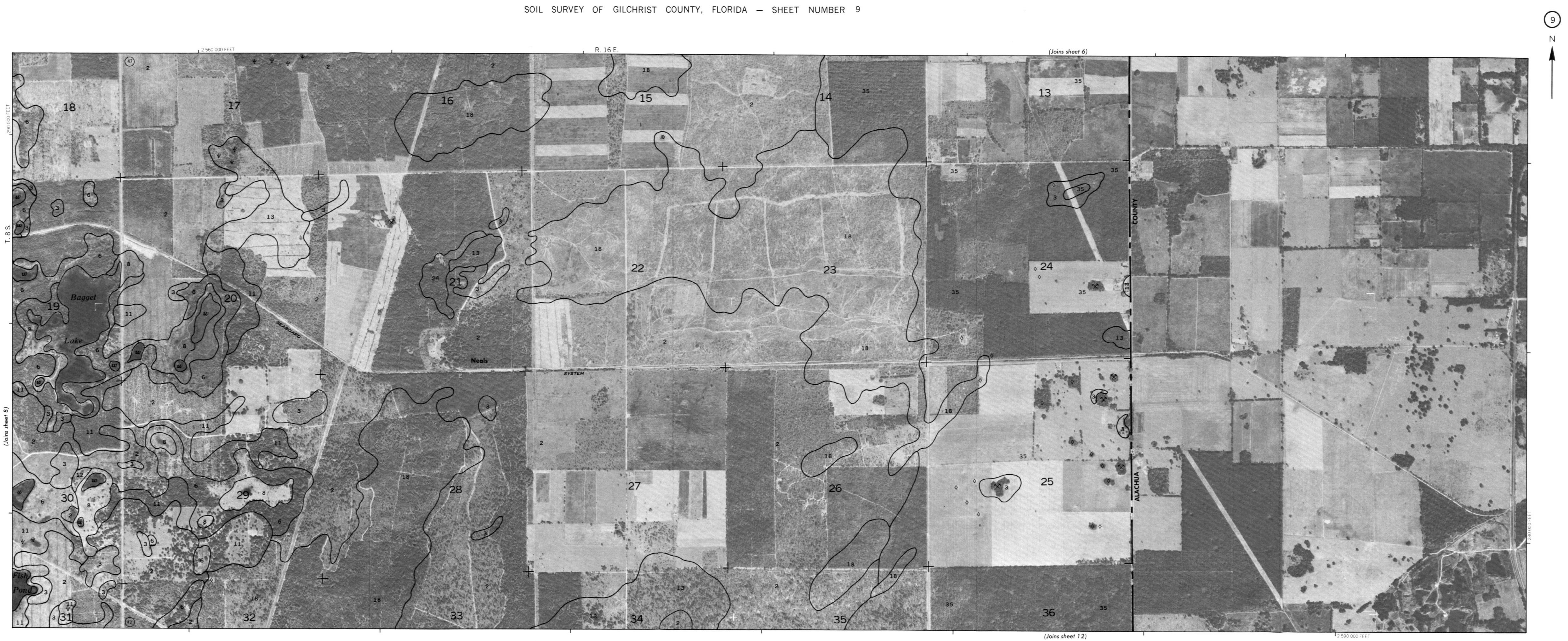
7

N



2 480 000 FEET
R. 14 E.
(Joins sheet 4)
T. 7 S.
(Joins sheet 8)
SUWANNEE
RIVER
DIXIE
COUNTY
16
17
19
20
21
22
23
26
27
28
29
30
32
33
34
35
14
15
(Joins sheet 10)
2 515 000 FEET
1
3/4
1/2
1/4
0
1 MILE
1
0.5
0
1 KILOMETER
SCALE 1:20 000


8
N
(Joins sheet 5)
R. 14 E. | R. 15 E.
R. 15 E. | R. 16 E.
(Joins sheet 7)
(Joins sheet 9)
(Joins sheet 11)
T. 8 S.
Williford
Cow Creek
Bay Horse Pond
Cannon Pond
Poley Cow Pen
Smiths Prairie
Sand Pond
Black Pond
Bell
Grass Pond
Fish Pond
2 520 000 FEET
1 MILE
1 KILOMETER
SCALE 1:20 000



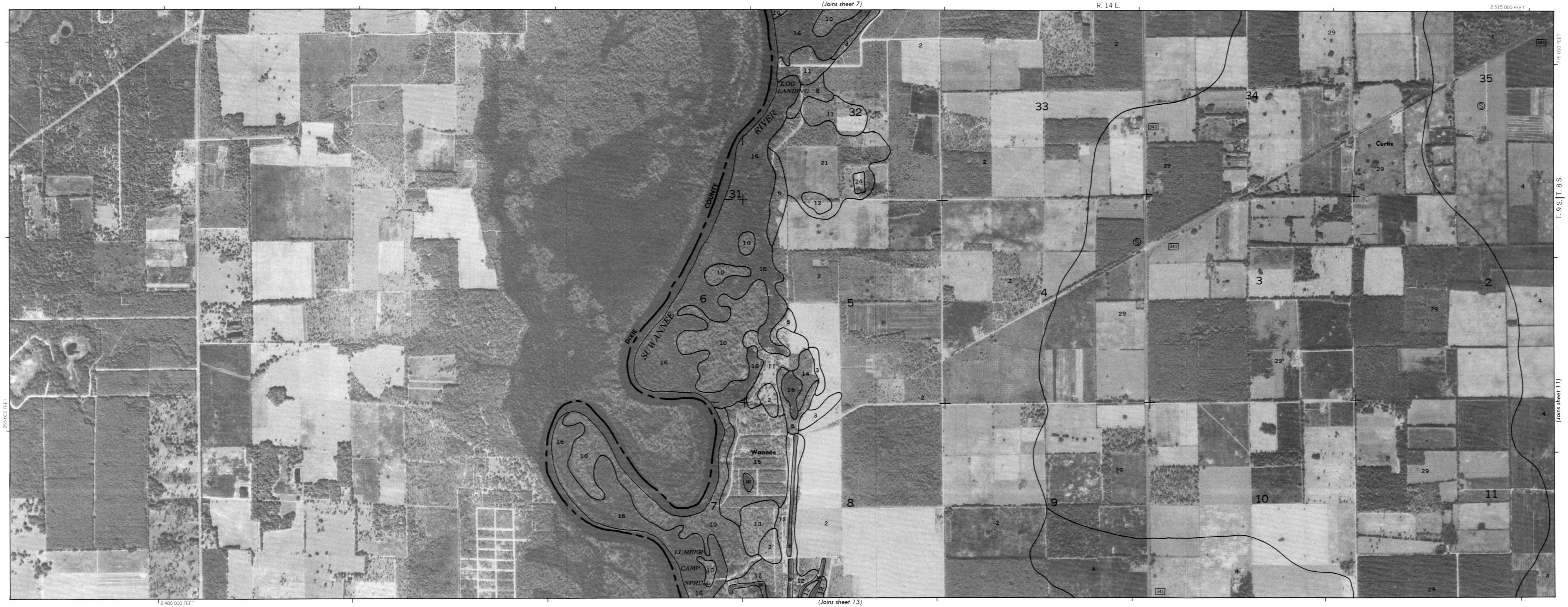
1   3/4   1/2   1/4   0   1 MILE

1   0.5   0   1 KILOMETER

SCALE 1:20 000

10

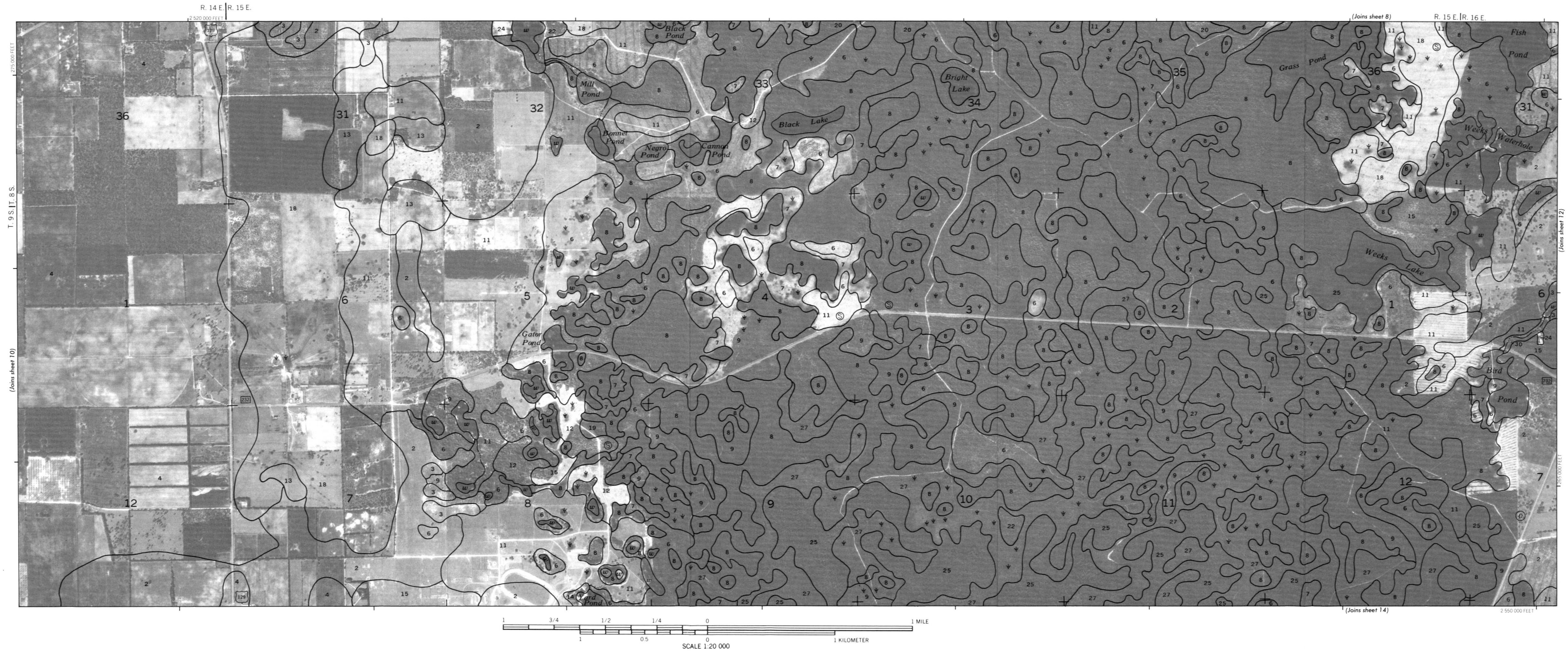
N



1 3/4 1/2 1/4 0 1 MILE

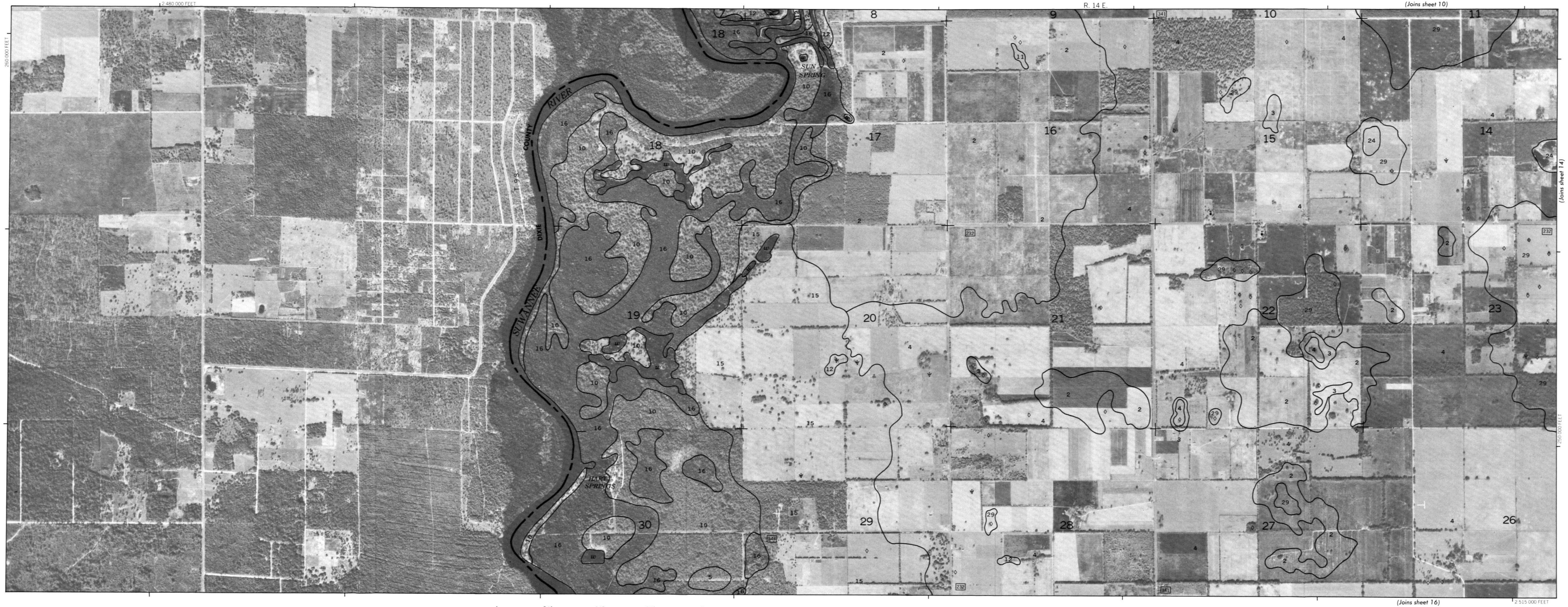
1 0.5 0 1 KILOMETER

SCALE 1:20 000


N
R. 14 E. | R. 15 E.
R. 15 E. | R. 16 E.
(Joins sheet 8)
(Joins sheet 10)
(Joins sheet 12)
(Joins sheet 14)
T. 9 S. | T. 8 S.
2 520 000 FEET
2 550 000 FEET
Mill Pond
Bonnet Pond
Negro Pond
Cannon Pond
Black Pond
Black Lake
Bright Lake
Grass Pond
Fish Pond
Weeks Waterhole
Weeks Lake
Bird Pond
Gator Pond
Yard Pond
1 3/4 1/2 1/4 0 1 MILE
1 0.5 0 1 KILOMETER
SCALE 1:20 000

12


N
(Joins sheet 9)
R. 16 E.
(Joins sheet 11)
(Joins sheet 15)
2 560 000 FEET
2 595 000 FEET
265 000 FEET
T. 9 S. T. 8 S.
ALACHUA COUNTY
1 MILE
1 KILOMETER
SCALE 1:20 000



1 3/4 1/2 1/4 0 1 MILE
1 0.5 0 1 KILOMETER
SCALE 1:20 000


14
N
(Joins sheet 11)
R. 14 E. | R. 15 E.
R. 15 E. | R. 16 E.
2 555 000 FEET
(Joins sheet 13)
(Joins sheet 15)
(Joins sheet 17)
2 520 000 FEET
250 000 FEET
T. 9 S.
Yard Pond
Wash Pond
Button Wood Pond
Morgan Pond
Fourmile Lake
Lee Lake
Threemile Lake
Sapp Lake
Jennings Lake
1 3/4 1/2 1/4 0 1 MILE
1 0.5 0 1 KILOMETER
SCALE 1:20 000

15

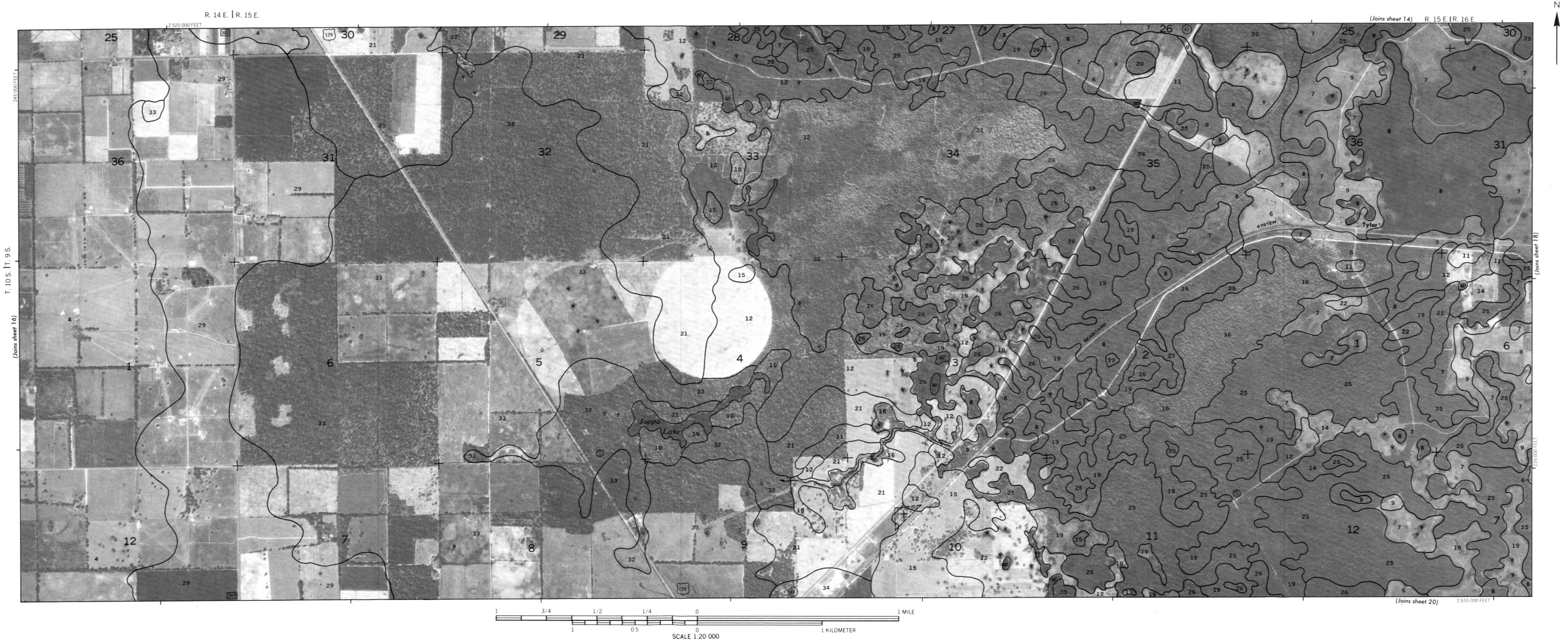
N

1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

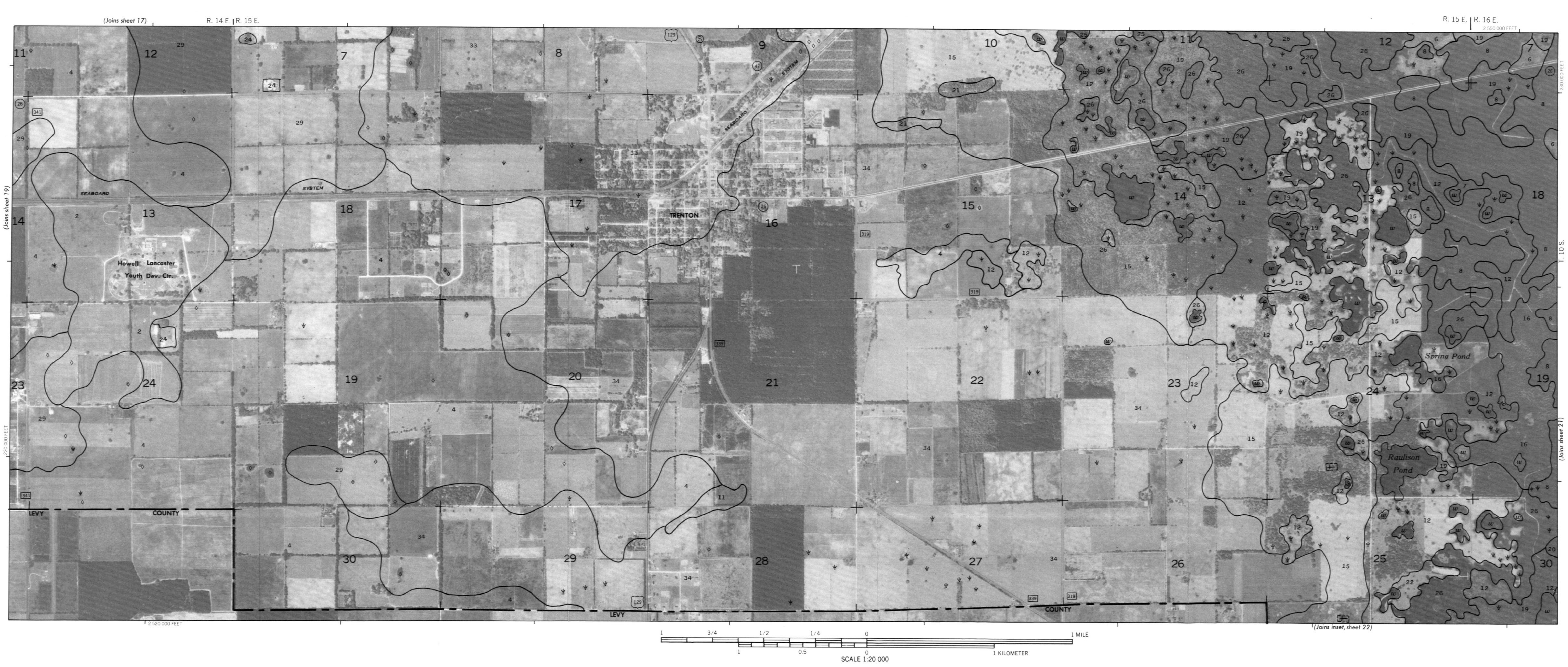
SCALE 1:20 000


16
N
(Joins sheet 13)
(Joins sheet 19)
(Joins sheet 17)
SUWANNEE RIVER
DIXIE COUNTY
DIXIE COUNTY
Otter Springs
Blitchville
R. 13 E. | R. 14 E.
T. 10 S. | T. 9 S.
2 480 000 FEET
2 515 000 FEET
235 000 FEET
265 000 FEET
1 3/4 1/2 1/4 0 1 MILE
1 0.5 0 1 KILOMETER
SCALE 1:20 000


17
N
R. 14 E. | R. 15 E.
R. 15 E. | R. 16 E.
(Joins sheet 14)
(Joins sheet 16)
(Joins sheet 18)
(Joins sheet 20)
T. 10 S. | T. 9 S.
2 520 000 FEET
2 555 000 FEET
245 000 FEET
Joppa Lake
Tyler
SEABOARD
SYSTEM
1 MILE
1 KILOMETER
SCALE 1:20 000


N
(Joins sheet 15)
R. 16 E.
2 595 000 FEET
(Joins sheet 17)
Five Mile Lake
Clear Pond
235 000 FEET
245 000 FEET
T. 10 S.
ALACHUA COUNTY
2 560 000 FEET
(Joins sheet 21)
1 3/4 1/2 1/4 0 1 MILE
1 0.5 0 1 KILOMETER
SCALE 1:20 000


N
(Joins sheet 16)
(Joins sheet 20)
2 480 000 FEET
R. 13 E. | R. 14 E.
230 000 FEET
220 000 FEET
2 515 000 FEET
SUWANNEE RIVER
DIXIE COUNTY
LEVY COUNTY
SEABOARD SYSTEM
Wilcox Junction
Wilcox
BELL SPRINGS
Suwannee River
1 3/4 1/2 1/4 0 1 MILE
1 0.5 0 1 KILOMETER
SCALE 1:20 000


N
(Joins sheet 17)
R. 14 E. | R. 15 E.
R. 15 E. | R. 16 E.
(Joins sheet 19)
(Joins sheet 21)
(Joins inset, sheet 22)
T. 10 S.
2 550 000 FEET
230 000 FEET
220 000 FEET
2 520 000 FEET
SEABOARD
SYSTEM
TRENTON
Howell Lancaster Youth Dev. Ctr.
Spring Pond
Raulison Pond
LEVY
COUNTY
1 MILE
1 KILOMETER
SCALE 1:20 000

21

N

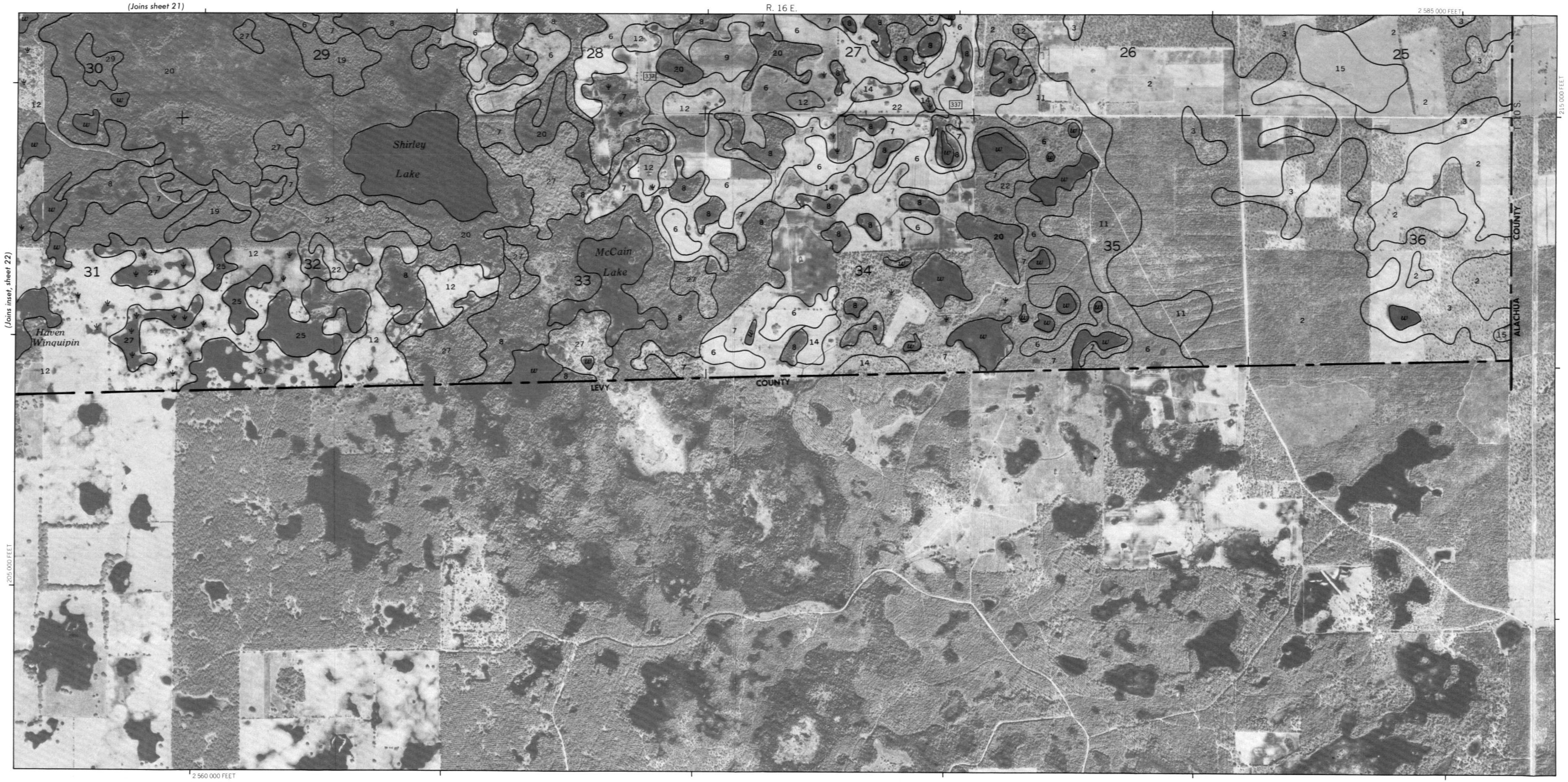
1 3/4 1/2 1/4 0 1 MILE

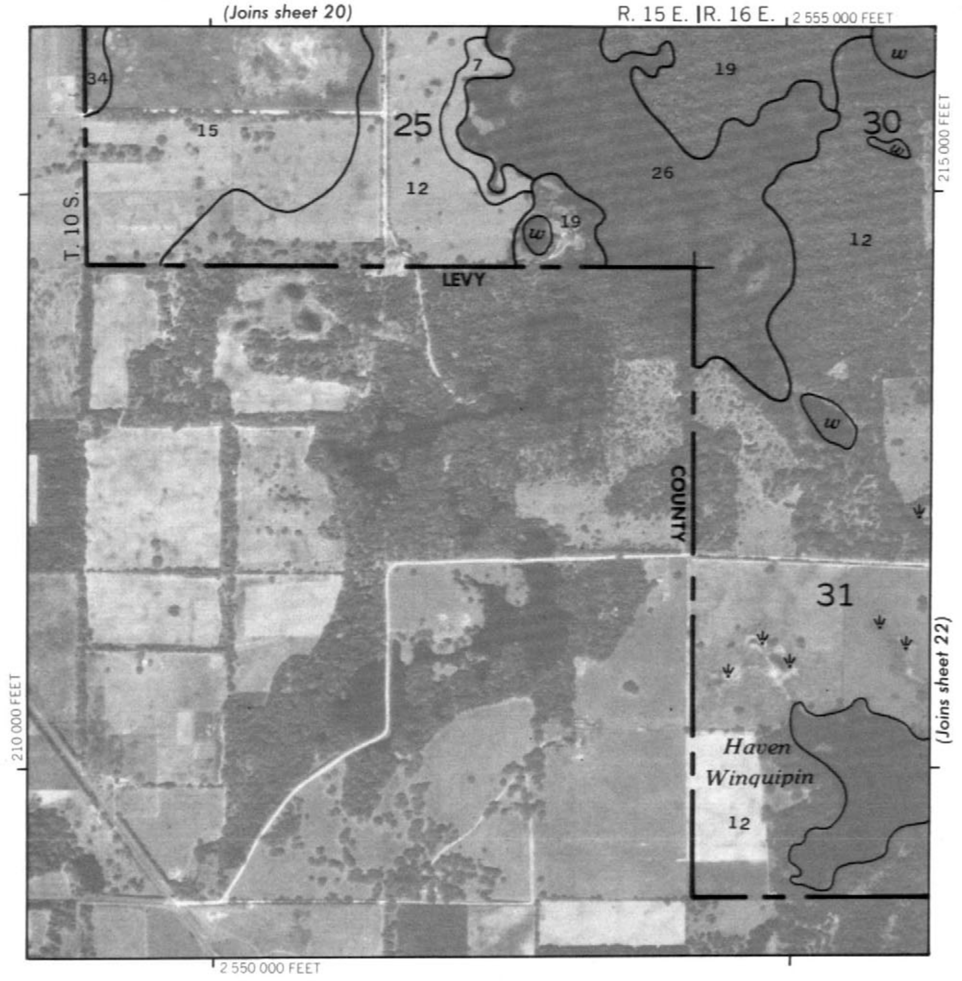
1 0.5 0 1 KILOMETER

SCALE 1:20 000

SOIL SURVEY OF GILCHRIST COUNTY, FLORIDA — SHEET NUMBER 22

N





1 3/4 1/2 1/4 0 1 MILE

1 0.5 0 1 KILOMETER

SCALE 1:20 000